Firmware User's Manual

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Recommended PC Specifications

In order to configure or test the cameras, a PC with following basic specifications is needed:

CPU	Core 2 Duo 2.13 GHz or above
Memory	2 GB or above
Operating System	● Windows XP with SP2 or above. ● Windows 2003 ● Windows Vista ● Windows 2008 ● Windows 7
Browser for Accessing Firmware	● Internet Explorer 8.0 or newer (full functionality) ● Safari with QuickTime installed (partial functionality) ● Other Browsers with Basic VLC Media Player (partial functionality)
Video Resolution	1024x768 or higher

Preparation

Connect the Equipment

To be able to connect to the camera firmware from your PC, both the camera and the PC have to be connected to each other via Ethernet cable. At the same time, the camera has to have its own power supply. In case of PoE cameras, you can use a PoE Injector or a PoE Switch between the camera and the PC. The cameras that have the DC power connectors may be powered on by using a power adaptor.

The Ethernet port LED or Power LED of the caxmera will indicate that the power supply for the camera works normally.

Configure the IP Addresses

In order to be able to communicate with the camera from your PC, both the camera and the PC have to be within the same network segment. In most cases, it means that they both should have very similar IP addresses, where only the last number of the IP address is different from each other. There are 2 different approaches to IP Address management in Local Area Networks – by DHCP Server or Manually.

Using DHCP server to assign IP addresses:

If you have connected the computer and the camera into the network that has a DHCP server running, then you do not need to configure the IP addresses at all – both the camera and the PC would request a unique IP address from DHCP server automatically. In such case, the camera will immediately be ready for the access from the PC. The user, however, might not know the IP address of the camera yet. It is necessary to know the IP address of the camera in other to be able to access it by using a Web browser.

The quickest way to discover the cameras in the network is to use the simplest network search, built in the Windows system – just by pressing the “Network” icon, all the cameras of the local area network will be discovered by Windows thanks to the UPnP function support of our cameras.

If you work with our cameras regularly, then **there is even a better way to discover the cameras in the network** – by using **IP Utility**. The IP Utility is a light software tool that can not only discover the cameras, but also list lots of valuable information, such as IP and MAC addresses, serial numbers, firmware versions, etc, and allows quick configuration of multiple devices at the same time.

The IP Utility can be downloaded for free from the website.

Use the default IP address of a camera:

If there is no DHCP server in the given network, the user may have to assign the IP addresses to both PC and camera manually to make sure they are in the same network segment.

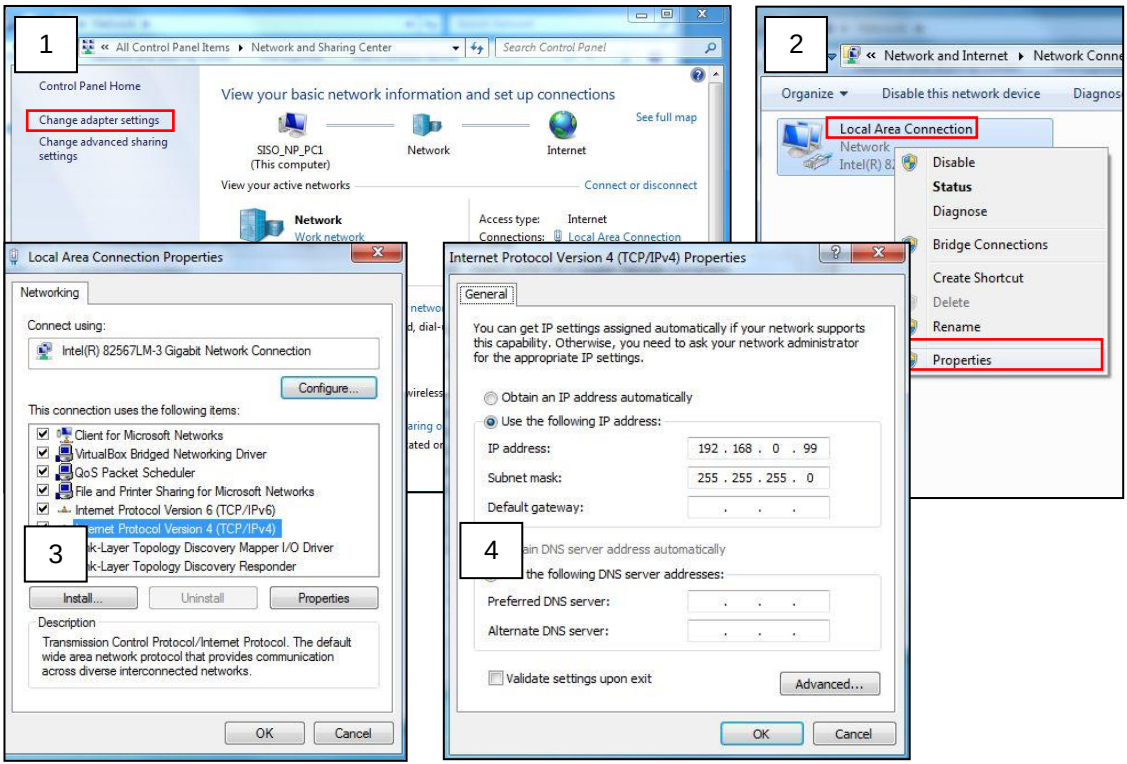
When the camera is plugged into network and it does not detect any DHCP services, it will automatically assign itself a default IP:

192.168.0.100

Whereas the default port number would be **80**. In order to access that camera, the IP address of the PC has to be configured to match the network segment of the camera.

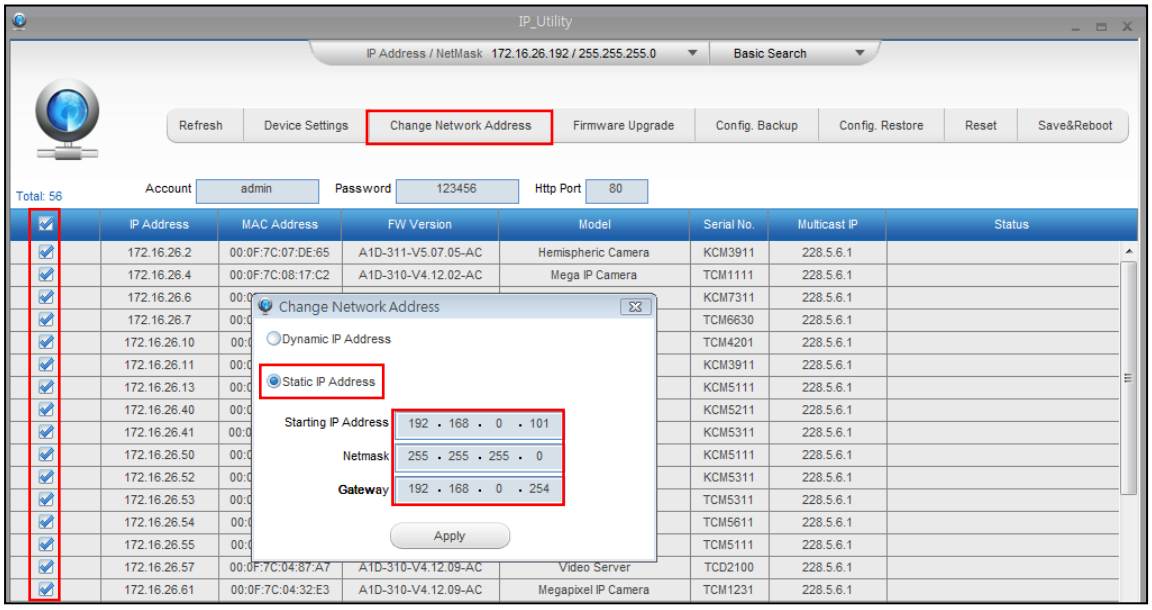
Manually adjust the IP address of the PC:

In the following example, based on Windows 7, we will configure the IP address to **192.168.0.99** and set Subnet Mask to **255.255.255.0** by using the steps below:



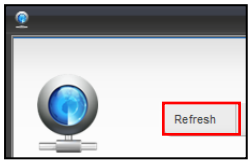
Manually adjust the IP addresses of multiple cameras:

If there are more than 1 camera to be used in the same local area network and there is no DHCP server to assign unique IP addresses to each of them, all of the cameras would then have the initial IP address of **192.168.0.100**, which is not a proper situation for network devices – all the IP addresses have to be different from each other. The easiest way to assign cameras the IP addresses is by using **IP Utility**:



With the procedure shown above, all the cameras will have unique IP addresses, starting from 192.168.0.101. In case there are 20 cameras selected, the last one of the cameras would have the IP 192.168.0.120.

Later, by pressing the “Refresh” button of the IP Utility, you will be able to see the list of cameras with their new IP addresses.



Please note that it is also possible to change the IP addresses manually by using the Web browser. In such case, please plug in only one camera at a time, and change its IP address by using the Web browser before plugging in the next one. This way, the Web browser will not be confused about two devices having the same IP address at the same time.

Access the Camera

Now that the camera and the PC are both having their unique IP addresses and are under the same network segment, it is possible to use the Web browser of the PC to access the camera.

You can use **any of the browsers** to access the camera, however, the full functionality is provided only for **Microsoft Internet Explorer**.

The browser functionality comparison:

Functionality	Internet Explorer	Other browsers
Live Video	Yes	Yes*
Live Video Area Resizable	Yes	No
PTZ Control	Yes	Yes
Capture the snapshot	Yes	Yes
Video overlay based configuration (Motion Detection regions, Privacy Mask regions)	Yes	No
All the other configurations	Yes	Yes

* When using non-Internet Explorer browsers, free third-party software plug-ins must be installed to the PC first to be able to get the live video feed from the camera:

Browser	Required Plug-In
Safari	QuickTime (http://www.apple.com/quicktime/download/)
Any Other Browser	Basic VLC Media Player (http://www.videolan.org)

Disclaimer Notice: The camera manufacturer does not guarantee the compatibility of its cameras with QuickTime and VLC – since they are third party softwares; the third party has the right to modify their utility any time which might affect the compatibility. In such cases, please use Internet Explorer browser instead.

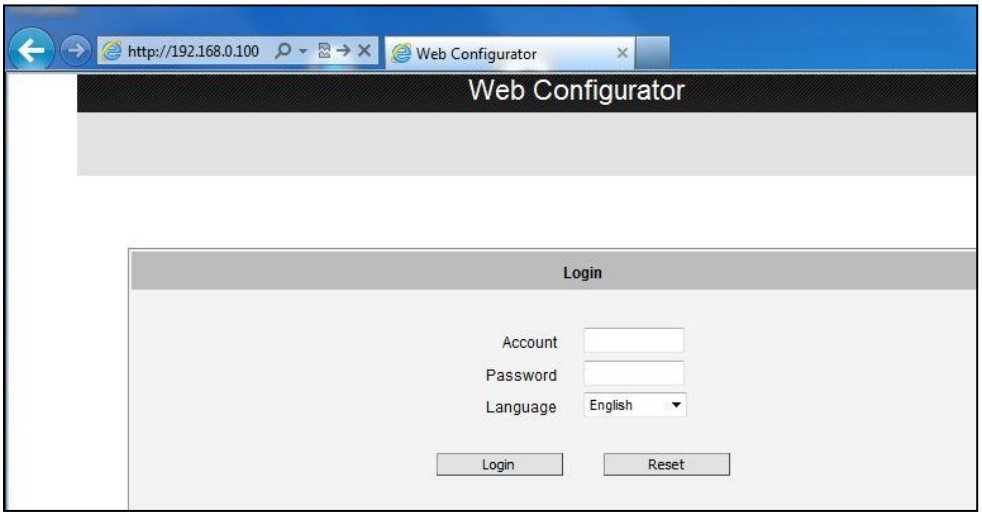
When using Internet Explorer browser, the ActiveX control for video stream management will be downloaded from the camera directly – the user just has to accept the use of such control when prompted so. No other third party utilities are required to be installed in such case.

The following examples in this manual are based on Internet Explorer browser in order to cover all functions of the camera.

Assuming that the camera's IP address is **192.168.0.100**, you can access it by opening the Web browser and typing the following address into Web browser's address bar:

http://192.168.0.100

Upon successful connection to the camera, the user interface called **Web Configurator** would appear together with the login page. The HTTP port number was not added behind the IP address since the default HTTP port of the camera is 80, which can be omitted from the address for convenience.



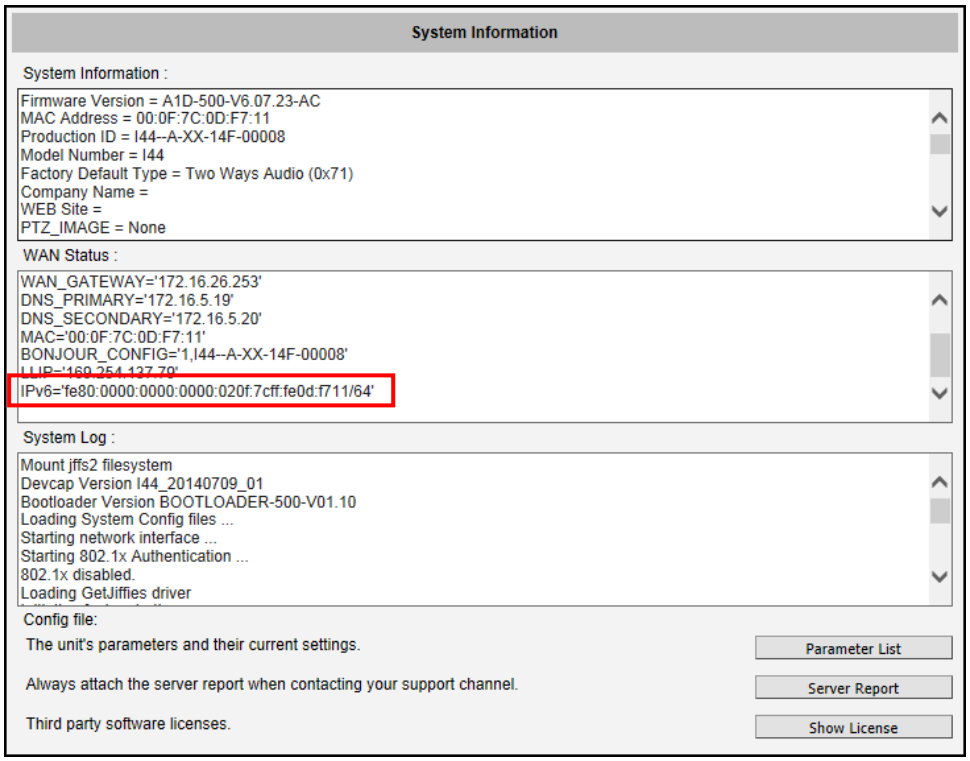
Before logging in, you need to know the factory default Account and Password of the camera.

Account: **Admin**

Password: **123456**

Using IPv6 to Access the Camera

The camera is IPv6-ready and has been assigned its unique static IPv6 address. The IPv6 address can be found under the **System > Sytem Info** menu (see ***System Info*** on page 104 for more information).



To access the camera with the IPv6 address, type the IPv6 address enclosed in square brackets on the web browser address bar. For example:

http://[fe80:0000:0000:0000:020f:7cff:fe0d:f711]

Live View

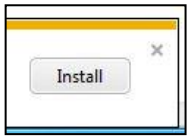
This section describes how to configure the IP camera. The administrator has unlimited access to all settings, while the normal user can only view live video.

Login

Initially there exists only administrator's account in the camera **(Account: Admin, Password: 123456)** – you have to use that account to log in. You can later create normal user accounts with limited access rights if necessary.

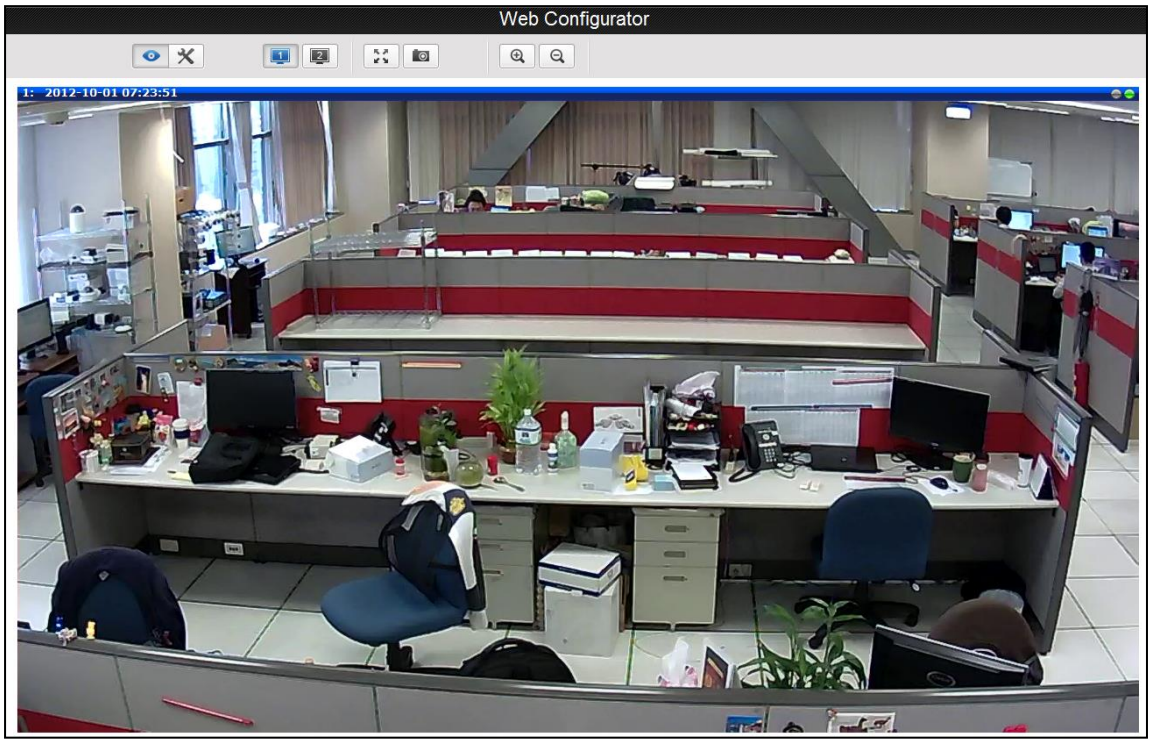
Feel free to choose your local language from the list of languages or keep it as English. After pressing "Login", you will be able to access the user interface of Web Configurator.

Upon successful login, you will be able to see the Live View page. In case of **Internet Explorer browser**, you may be prompted to allow the installation of ActiveX control from the camera. Press "Install" then. The live video will appear shortly after that.



Live View

The live view will appear automatically with the video resolution of **1280x720** (1MP cameras) or **1920x1080** (2-5MP cameras).



While being on the Live View page, the Live View icon appears as being pressed:
If you leave the Live View page, you can later return by pressing that button.

The buttons shown on the Live View page vary depending on the functions supported by the camera.

If the resolution of the PC's monitor is bigger than the resolution of the live video, you will be able to see the whole size of the video immediately. If not, you will only see part of the video at first and you would have to use the scroll bars to see the rest of the video area. In order to see the whole video on your display, you can temporarily re-scale the video to better fit your screen by pressing the digital zoom buttons:

- Enlarge the video size digitally

- Reduce the video size digitally

Notice: These digital zoom adjustments do not influence the actual video resolution of the camera. Regardless of how large or small the video appears on the display after pressing the digital zoom buttons, the actual video stream size of the camera is the same as before.

You can also digitally re-scale the video to fully match the size of your display with just 1 click:

- Full screen Mode

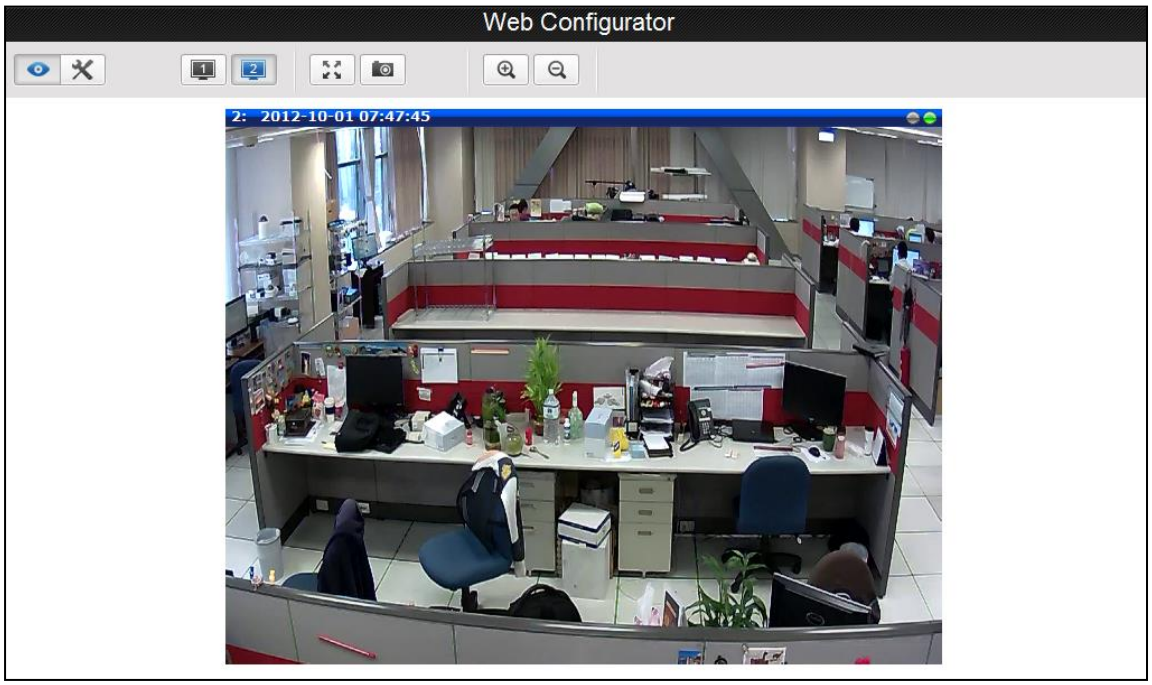
You may use **ESC** key from the keyboard to exit the full screen mode.

The cameras have the **dual stream** capability – the **Stream 1** is usually the high resolution stream with the purpose of being recorded by NVR while **Stream 2** has lighter video configuration for NVR live view purposes, to reduce the computing power of the NVR PC. Both streams can be configured under Web Configurator's Setup page. To see how each of the stream looks like, there are quick buttons on the Live View page:

- Show the Stream 1 video

- Show the Stream 2 video

When pressing the Stream 2 button, the Live View would look like this:



To capture the snapshots of the current live view, press the snapshot button. The snapshots are saved in Pictures folder.

- Take a Snapshot

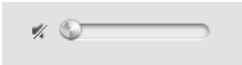
Cameras with audio function have the audio controls on Live View page.

- **Speak to Camera**

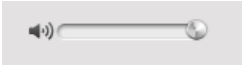
To speak to the camera, press the button. If the camera is connected to a network video recorder, the audio will be recorded with the video stream.

To adjust the volume level of the speakers connected to the PC that runs the Web Configurator in order to hear the audio from the camera's microphone or line-in device, use the audio controls as below:

Audio Muted:



Audio level adjusted to the maximum:



This volume control appears on the user interface only when the Audio-in function of the camera has been "Enabled" under Setup page.

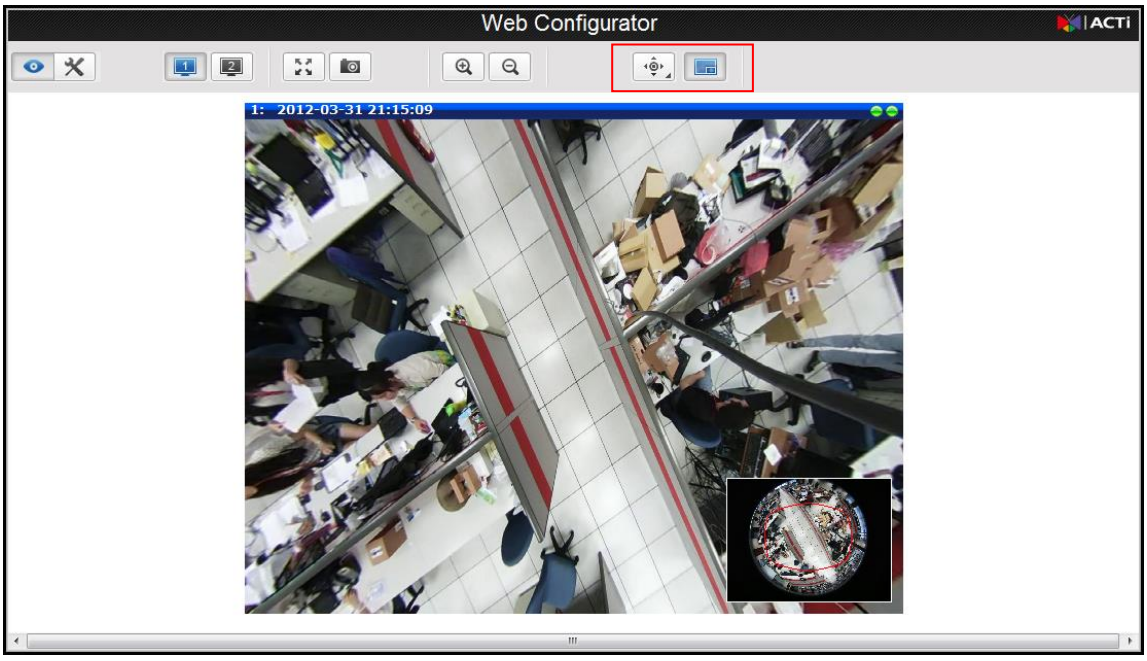
The digital output controls appear on the Live View page of the cameras with digital input/output function. The controls allow users to manually trigger a DO device.

- Select DO Port

Each DO ports are controlled separately. For cameras with more than one DO ports, select the DO port and press to set the output power level to high or to set the output power level to low. Consequently, setting the port to a high power level “activates” the DO device and setting the port to a low power level “deactivates” the DO device. For example, if an alarm is set as DO1 and is pressed, the alarm will continuously sound until is pressed to deactivate the device.

View Modes

For Hemispheric and Fisheye cameras, the Miniature Fisheye-View and View Mode buttons appear on the Live View screen.



By default, a miniature of the Fisheye view is shown on the lower right corner of the Live View, press to hide the miniature fisheye-view or to display it.

You can change the viewing mode into:

- **ePTZ View Mode**

- **Panorama View Mode**

- **Fisheye View Mode**

ePTZ View Mode

ePTZ mode works as an optical PTZ (pan-tilt-zoom) function. You can change the viewing direction by moving the mouse over the Live View screen and clicking towards the direction you wish to view. The mouse cursor is represented by a red "**+**" mark.

If Miniature Fisheye-view is enabled, the current direction and scope of view is shown on the Miniature Fisheye-view window with the red marking.

Panorama View Mode

This mode allows you to view the camera in panorama view where details can be seen more clearly. When the camera is installed on the ceiling, there will be two panorama views, one for the upper hemisphere and another for the lower hemisphere. The lower hemisphere is displayed with an inverted direction when viewed on panorama.

If Miniature Fisheye-view is enabled, the current scope of view is shown on the Miniature Fisheye-view window with the red marking.

Fisheye View Mode

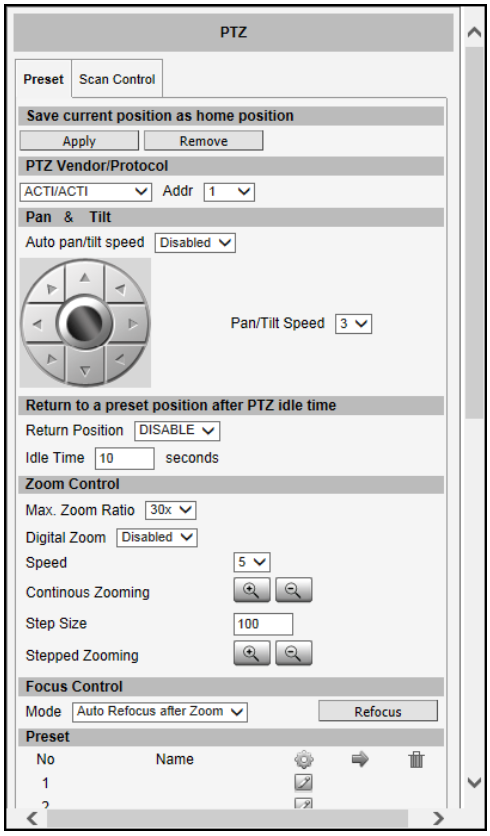
This mode shows the camera view as though viewing from a fish's eye with the whole viewing angle in sight but details may be too small and not be seen clearly.

PTZ Control Panel (For PTZ and Zoom Cameras)

For PTZ and zoom camera models, click the PTZ button on the Live View screen to display the PTZ Control Panel. On the PTZ Control Panel, users can do any the following:

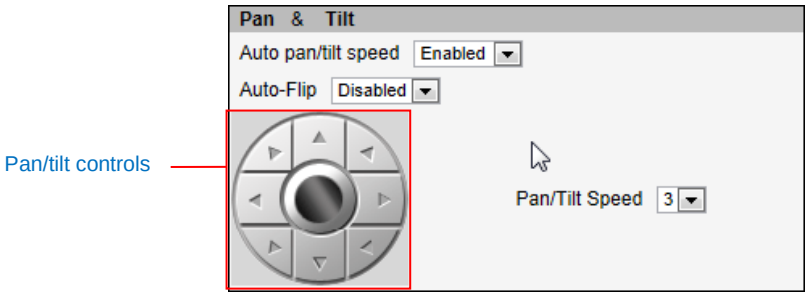
- Set the home position
- Set the serial hex command protocol and address
- Pan the camera
- Zoom the camera in or out as well as adjust the zoom speed and step size
- Set the focus to auto refocus or manual
- Set Preset points for touring
- Set Camera Tour
- Set Scan function (PTZ and Speed Dome only)

NOTE: The PTZ Control Panel may differ depending on camera model.



How to Use Pan/Tilt

Click the pan/tilt controls to pan/tilt the PTZ camera.



Other pan/tilt features include:

- **Auto pan/tilt speed**: When “Enabled”, the camera automatically sets the pan/tilt speed according to the zoom ratio and the selected pan/tilt speed while retaining the clarity and quality of image even as the camera is panning or tilting. When “Disabled”, the pan/tilt

speed follows the value selected on the **Pan/Tilt Speed** field.

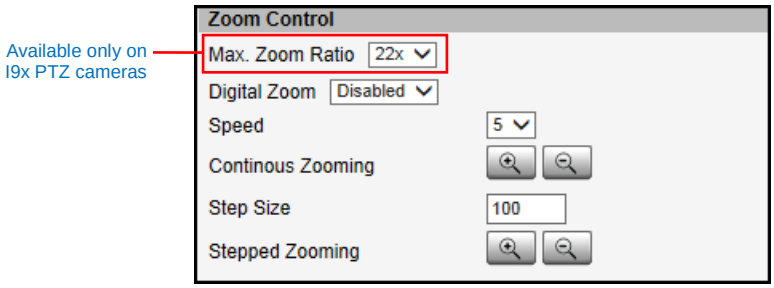
- **Auto-Flip**: When “Enabled”, the camera automatically flips the image when the camera is pan at 180° and then continues panning to the same direction up to 360°. When “Disabled”, users can only pan the camera to one direction up to 180°.

  NOTE: Available only in PTZ I9x camera models.
- **Pan/Tilt Speed**: Select the desired pan/tilt speed. The bigger the number, the faster the speed is.

TIP: While the PTZ Control Panel is open, instead of using the pan/tilt controls, move the mouse cursor over the Live View, the mouse cursor will turn into zoom in/out or directional icons (e.g. / / / / etc.). Click or drag the mouse to zoom in/out or pan/tilt the camera view.

How to Zoom the Camera In or Out

Zooming can be done continuously or by one step (one click) at a time.



To zoom continuously, do the following:

1. On **Zoom Control**, select the **Speed**, wherein the bigger the number, the faster is the zooming speed.
2. Click and hold the left mouse button on zoom in or zoom out. When the mouse button is released, zooming stops.

To zoom by step zooming, do the following:

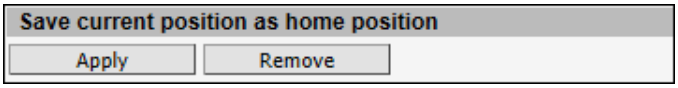
1. On **Zoom Control**, enter the desired step size. **Size** is the amount of zoom scale taken in each step.
2. Click the left mouse button on zoom in or zoom out. One zoom step is taken for each click.

For PTZ camera models, users can enable the **Digital Zoom** feature. When enabled, once the optical zoom reached its maximum, the camera continues to zoom in the image using digital zoom.

TIP: While the PTZ Control Panel is open, instead of using buttons, move the mouse cursor over the Live View, the mouse cursor will turn into zoom in/out (e.g. /). Click or drag the mouse to zoom in/out the camera view.

For PTZ cameras with zoom ratio of 18x and above, like the I9x models, users can set the **Max. Zoom Ratio** on the user interface. Setting the maximum zoom ratio helps to ensure that focus is kept all throughout the zoom in/out process. For other cameras with optical zoom lens, setting the maximum zoom ratio can be done through the URL command.

How to Set the Home Position



1. Pan, tilt, and zoom on the area that you want to set as the home position.
2. Click the **Apply** button on the **Save current position as home position**.

How to Set Serial Hex Command Protocol

The cameras and video management systems fully support the URL Command, a high level PT command set. However, in case the cameras will be used with devices from third party vendors that only support Serial Hex Command (low level PT command set), users must select the **PTZ Vendor/Protocol** to use and its address. Otherwise, leave the default settings.

How to Adjust the Focus

After zooming the camera in or out, it is recommended to readjust the focus in **Focus Control**.

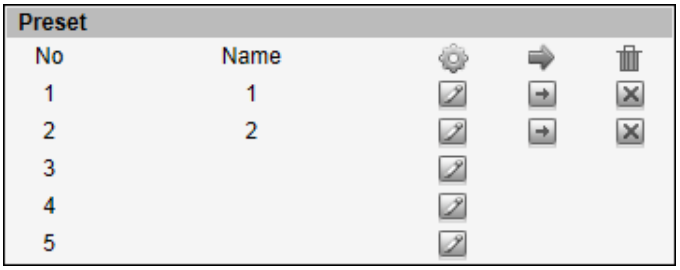
Options are:

- **Auto Refocus after Zoom**: Select this option to let the camera automatically adjust the focus after zooming.
- **Manual**: Select this option to manually adjust the focus. This feature is useful if the automatic focus position is not the position that the user wants to achieve. To adjust the focus manually, select the **Step Size** and then click the step focus in or focus out icons until the desired focus is achieved.

When an option is selected, click the **Refocus** button to apply the focus adjustment.

How to Set Touring Preset Points

Preset points are user-defined areas that the camera can zoom in to. A series of preset points can be grouped as one **Tour**.



To create a preset point, do the following:

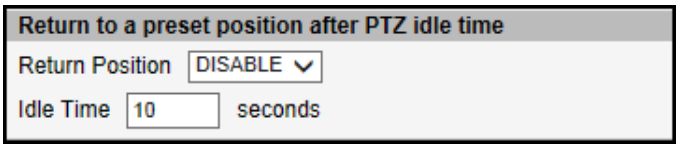
1. On **Preset**, click a icon to start creating a preset point.
2. Under the **Name** field, type a preset point name.
3. Pan, tilt, and zoom on the area that you want to set as the preset point.
4. Once done, click the icon again to close and complete the preset point.
5. Repeat the above procedures to create more preset points.

To go to the preset point directly, click .

To delete the preset point, click .

How to Set Idle Time and Return Camera to Predefined Position

This feature allows the camera to go directly to a predefined position after an idle period of time. Idle time refers to the time when the camera has no operation like pan, tilt, zoom or tour activity.

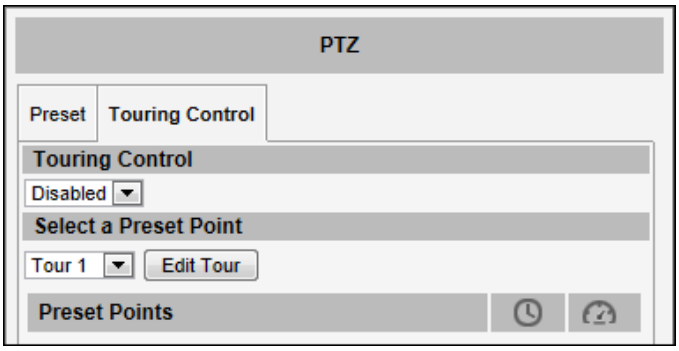


To set the camera to go to a predefined position, do the following:

1. On **Return Position**, select one of the following options:
   a. **Home Position**: The camera will go to the Home position as defined in ***How to Set the Home Position*** on page 23.
   b. Preset point name: The camera will go to the preset point which is already configured (see ***How to Set Touring Preset Points***).
   c. **DISABLE**: To disable this functiion.
2. On **Idle Time**, type the duration of time (seconds) wherein the camera is considered idle.

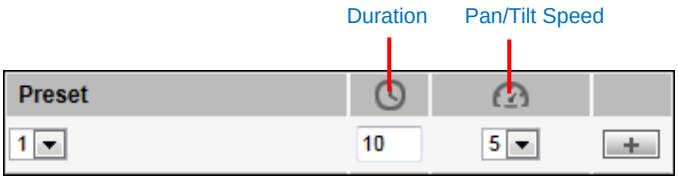
How to Set and Enable Tours

Once a preset point is created, the **Touring Control** page tab appears. Click the **Touring Control** page tab to configure the **Preset Tour**. A **Preset Tour** directs the camera to cycle through a sequence of preset points and stay on each preset point for a specific time.

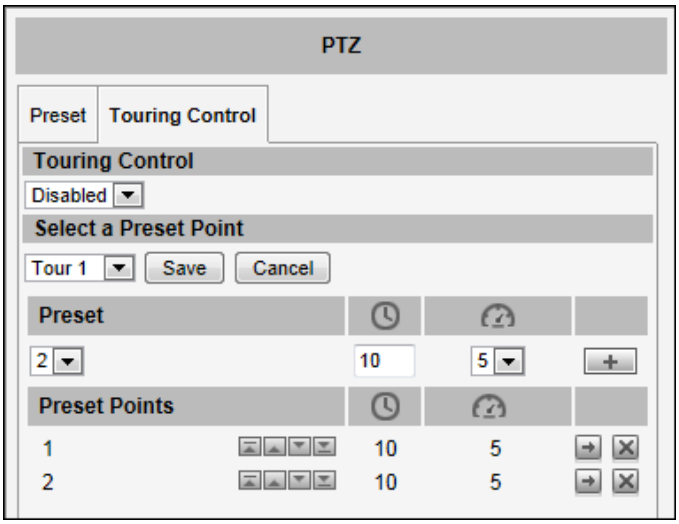


To set or modify a tour, do the following:

1. On **Select a Preset Point**, select a tour and then click **Edit Tour**.
2. Select a preset point from the list, set the duration (sec) of how long the camera will stay in that point and the pan/tilt speed (the bigger the number, the faster the speed), and then click .



3. On the **Preset Points**, the preset points added to the Tour are listed.



- To change the sequence of preset points, click the (first / up / down / last) icons.

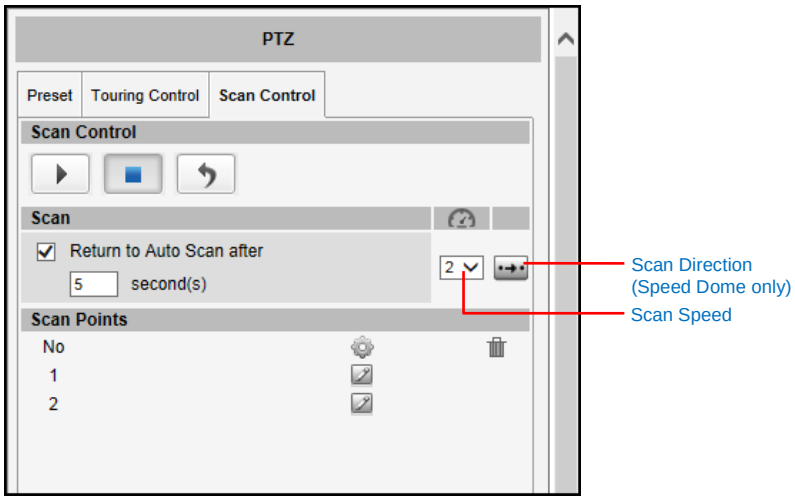
- To directly go to the preset point, click the icon.
- To delete the preset point from the list, click the icon.

4. Repeat steps 2 and 3 to add more preset points to the tour.
5. Once done, click the **Save** button on **Select a Preset Point**.
6. On **Touring Control**, select the tour name to activate. Once activated, the camera will start the tour.

How to Use the Scan Function (for PTZ only)

The **Scan Control** page enables the camera to go from one predefined point to another by scanning the view horizontally without losing focus. Unlike in preset tours, wherein the camera goes to one preset point to another quickly and focusing only on the present point area, scan function goes over point 1 to point 2 on a steady pace with the whole viewing angle in complete focus. The scan speed can also be configured according to user preference.

Click the **Scan Control** page tab to configure scan function.



To set or modify scan points, do the following:

1. On **Scan Points**, click the icon of scan point **1** to set the scan starting point.
2. Pan and tilt on the area that you want to set as scan point **1**.
3. Once done, click the icon again to close and complete first scan point.
4. Click the icon of scan point **2** to set the scan ending point.
5. Pan and tilt on the area that you want to set as the ending point.
6. Once done, click the icon again to close and complete scan point **2**.
7. Select the preferred **Scan Speed** (the bigger the number, the faster the speed).
8. Select the preferred **Scan Direction**: **Clockwise** or **counter-clockwise** (this features is

available only in speed dome cameras.

When a scan point has been set, the corresponding **Delete** icon appears. To remove the scan point, click .

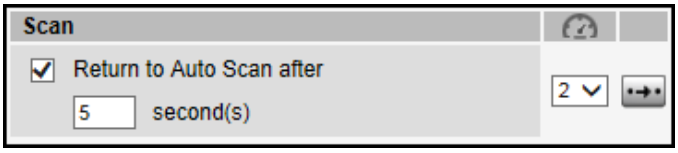
How to Manage Scan

To start scanning, click .

To restart scanning from the starting point while scanning is in progress, click .

To stop scanning, click .

When scanning is interrupted by other camera operation, like pan, tilt, zoom, etc., checking **Return to Auto Scan after** box enables the camera to resume scan function after the defined period of time (seconds).



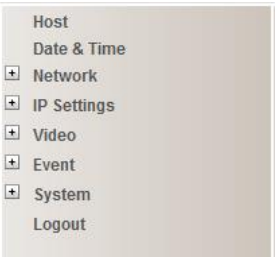
Setup

The following chapters guide you through the Setup functions of the camera.

Access the Setup Page

To configure any of the camera settings, go to the Setup menu by pressing the following button on Live View page:

- Go to Setup



The left side of the Setup page contains the list of Setup items.

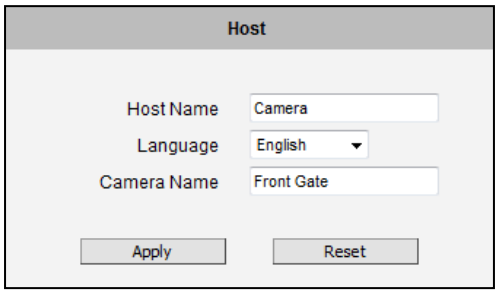
Notice: The exact content of the menu list varies for each camera, depending on the actual capabilities of each camera. This manual, however, is designed to explain all the possible functions.

Several items in the Setup page are divided into groups, such as Network, IP Settings, etc. You can expand the groups to see the sub-items by pressing the [+] button.

The following chapters of this manual explain each Setup item separately. The chapters are listed in the same order as the list of Setup menu items.

Host

The section “Host” allows the administrator to define the name of the camera and preferred user interface language.



There are two kinds of names – Host Name and Camera Name.

Host Name is used to identify the camera by a DHCP server. In some networks with very strict security policy, it is required that all the network devices should have their host name, and when the devices attempt to access the network by requesting an IP address from a DHCP server, the DHCP server would check if the host name is among the allowed devices. On this page, it is possible to edit the Host Name. To actually include the Host Name in DHCP discovery packet sent from a camera, please go to **IP Settings** and make sure the device is in **Dynamic IP Address** mode and “Use host name” is checked.

Camera Name is used to identify the device by **Video Management System** or by **Software Tools**. Usually, upon installation of the camera, the actual installation location is used as an easy-to-remember Camera Name, such as “Front Gate” or “Elevator 1”. In many cases the VMS is able to modify the Camera Name directly via its own user interface without needing to access Web Configurator.

Language selection under Host has the same purpose as the one on the login page of Web Configurator.

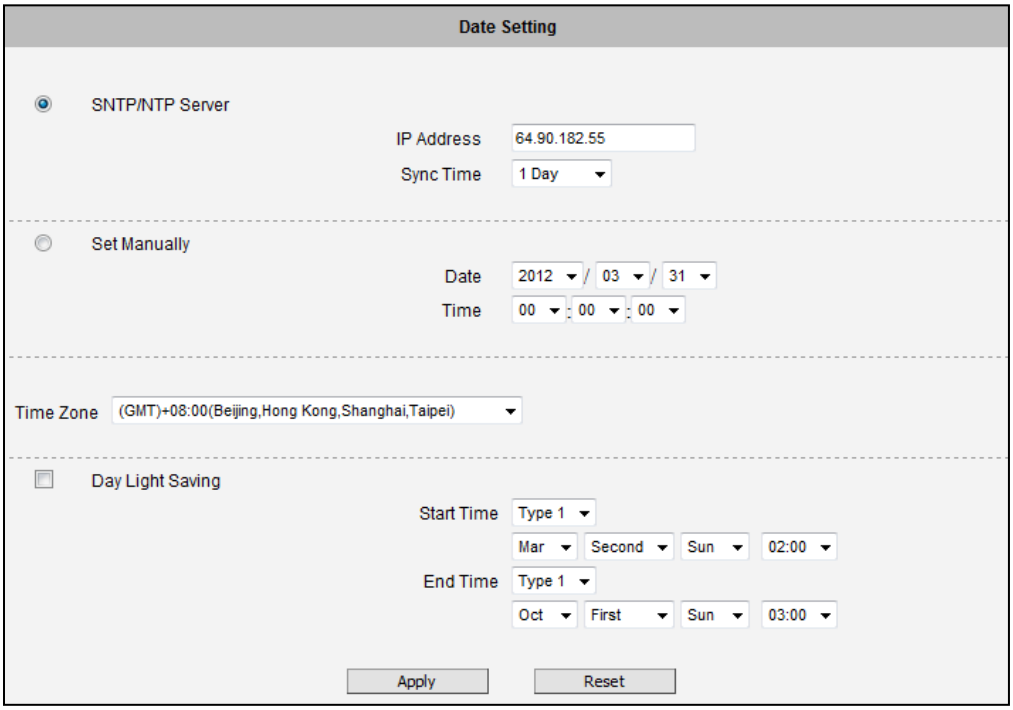
After changing any of the items above, press **Apply** to save the changes. The Reset button undoes the changes that had just been made but not Applied yet.

Date & Time

Each video frame contains a time stamp. The accuracy of the time stamp is very important for incident investigators. Therefore the clock of the camera has to be adjusted to most accurate time possible.

The section **Date & Time** provides the options for adjusting the date and time of the camera.

There are two ways to adjust the date and time – **automatically** by getting date and time regularly from any of the **NTP servers** worldwide, or **manually** by selecting proper time zone, date and time. The automatic way can be used only if the camera has an access to NTP servers. If you are using an isolated Local Area Network without Internet access, you can only use Manual date and time adjustment mode.



When choosing **SNTP/NTP Server** for automatic date and time updating, you can key in the IP address of the NTP server and the time interval for automatic time synchronization. If you want to key in the domain name of NTP server instead, please make sure the DNS server IP address has been set under IP Settings; otherwise the camera will not be able to resolve the domain name of the NTP server.

If all the cameras are getting the date and time from the same NTP Server, you can be most sure that the video clips from different cameras can be well synchronized later for comparison purposes.

To choose the most suitable NTP Server to synchronize date and time with, please refer to the worldwide pool of NTP Servers: http://www.pool.ntp.org/en/

When choosing **Set Manually** mode, you can adjust the date and time by the select boxes. Choose the appropriate **Time Zone** from the select box, too. If your location is not listed there, then pick any of the listed zones which GMT is identical with your location.

For the countries with daylight saving policy, there is **Day Light Saving** function with two different types:

Type 1 – define the starting or ending time of daylight saving period by the **number of the week in the month** (First, Second, Third or Last week).

Type 2 – define the starting or ending time of daylight saving period by the **exact date in the month** (1-31).

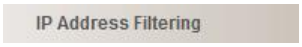
Whether to choose Type 1 or Type 2, please refer to the daylight saving policy of given country.

After changing any of the items above, press **Apply** to save the changes. The Reset button undoes the changes that had just been made but not Applied yet.

Network

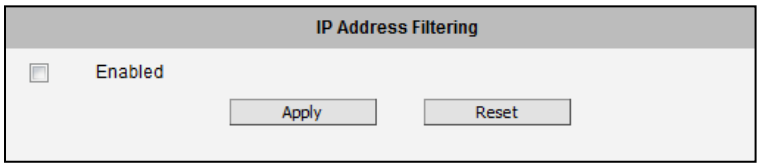
The section **Network** provides the list of network related functions and services. The [+] mark before Network indicates that the list can be expanded by clicking on it. Once expanded, the list can later be collapsed again by clicking on the [-] mark.

IP Address Filtering

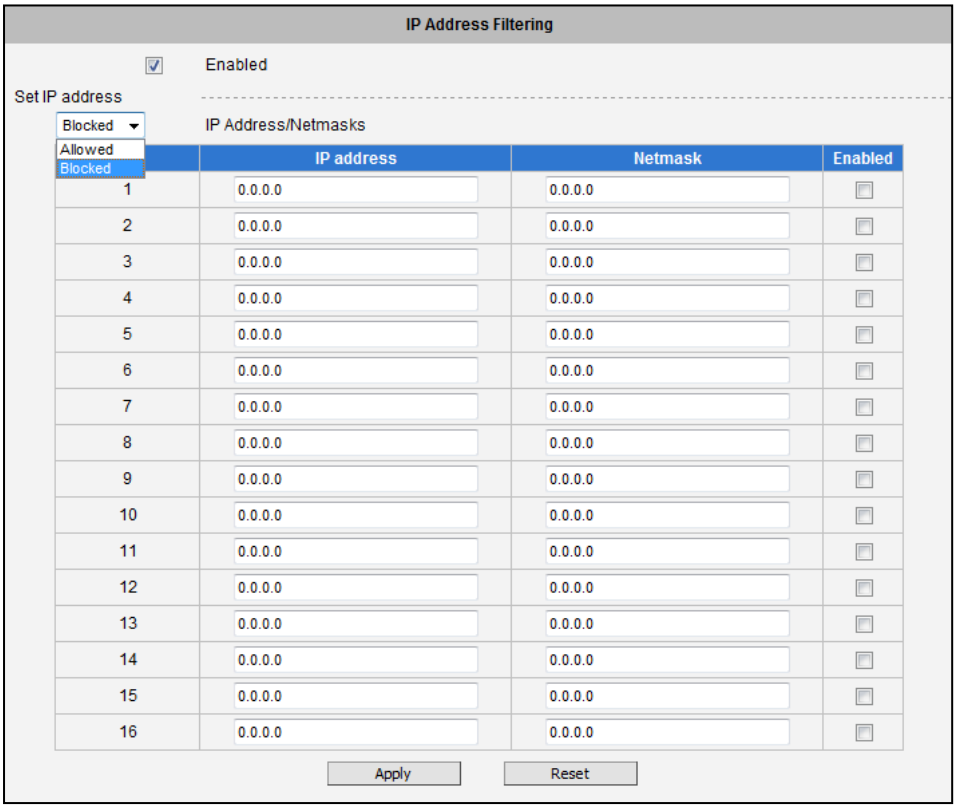


By **"IP Address Filtering"** function it is possible to define which devices (their IP addresses) are allowed to connect to this camera, and which devices are forbidden to connect to this camera.

Check the box "Enabled" to activate the IP address filtering function and press Apply.



Below you can select either "Allowed" or "Blocked" list to add items there and Enable them with the checkbox behind each row.



“Allowed” mode will refuse access to all IP addresses except the ones listed below.
“Blocked” mode will accept all incoming access except the IP addresses listed below.

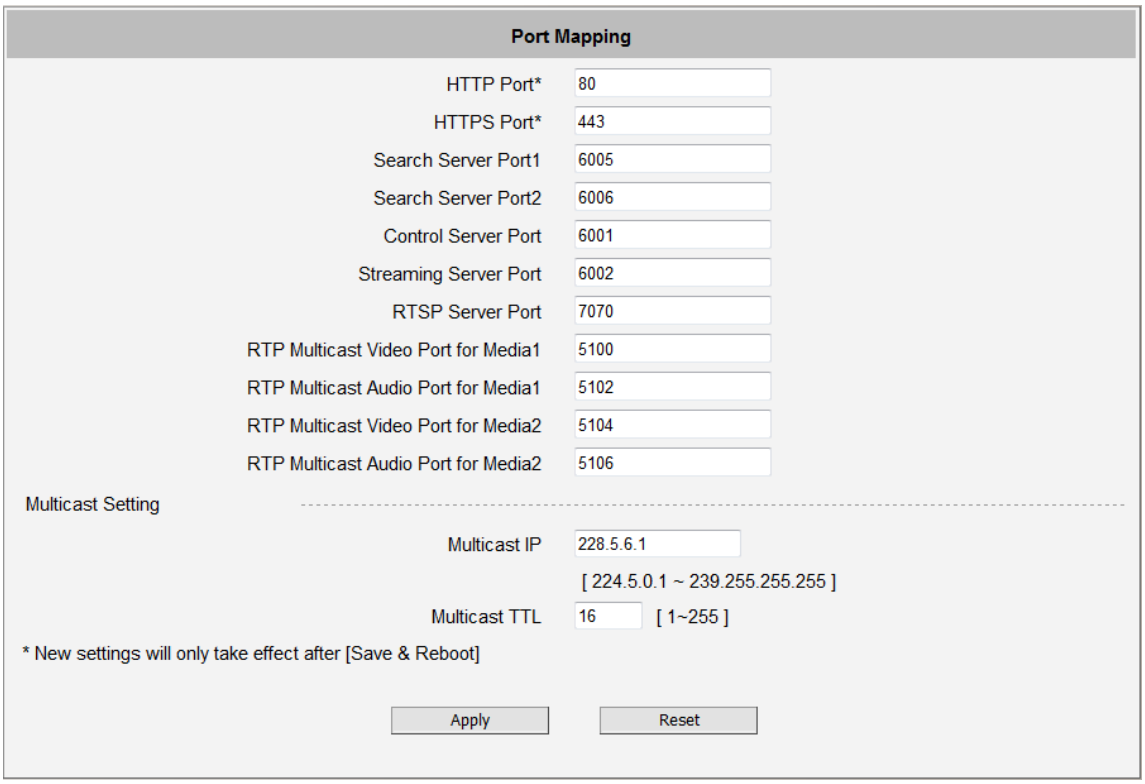
Using **Netmask** (Subnet Mask) allows you to set filtering for a whole range of IP address at once, without the need to enter all of them individually. If you are not sure about the function of Netmask, then you should use 255.255.255.255, and it will affect only a single IP address per line of entry, or use 255.255.255.0 to use the same setting for all IP addresses starting with the same three numbers. .

After changing any of the items above, press **Apply** to save the changes. The Reset button undoes the changes that had just been made but not Applied yet.

Warning! Do not accidentally block your own IP address that you are connecting from; otherwise you will not be able to access the camera any more to undo the changes. If this happens by mistake, you can do the hardware reset – it will clear all the filtering rules.

Port Mapping

Port Mapping The section **Port Mapping** provides the list of services and protocols that require their own port number for communication. By default, the camera already has all the ports defined. On this page, the user can modify the port numbers in case there is a specific need for that. Most often, the HTTP port is changed to something other than 80 in order to match with easy-to-remember port forwarding rules of the router that acts as a bridge between local area network and Internet.



NOTE: Some items appear only if the camera model supports the function.

Parameters	Description
HTTP port	Select the port assigned for HTTP protocol access.
HTTPS Port	Select the port assigned for HTTPS protocol access.
Search Server Port1	Select the first port used by server search applications to detect this IP device (e.g. IP Utility).
Search Server Port2	Select the second port used by server search applications to detect this IP device (e.g. IP Utility).
Control Server Port	Select the port used to support video control function by application programs (e.g. NVR).
Streaming Server Port	Select the port used by this IP device for Video Streaming (TCP).
RTSP Server Port	Select the port assigned for RTSP protocol access.

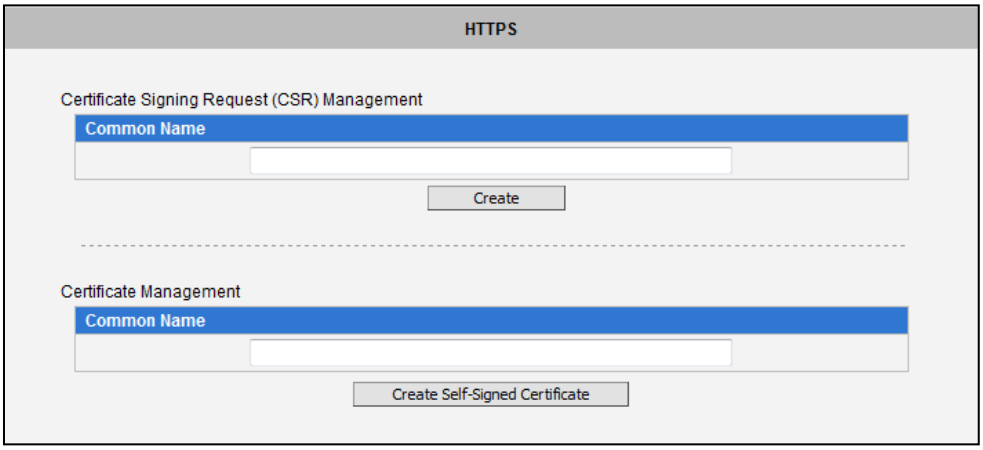
RTP Multicast Video Port for Media1	Select the port for the multicast video streaming of Stream 1 via RTP protocol.
RTP Multicast Audio Port for Media1	Select the port for the multicast audio streaming of Stream 1 via RTP protocol. **NOTE:** Appears only if the camera model supports audio input/output.
RTP Multicast Video Port for Media2	Select the port for the multicast video streaming of Stream 2 via RTP protocol. **NOTE:** Appears only if the camera model supports dual stream.
RTP Multicast Audio Port for Media2	Select the port for the multicast audio streaming of Stream 2 via RTP protocol. **NOTE:** Appears only if the camera model supports audio input/output and dual stream.
Multicast IP	Select the multicast IP. Default settings is 228.5.6.1
Multicast TTL	Select the multicast TTL. Default setting is 255

After changing any of the items above, press **Apply** to save the changes. The Reset button undoes the changes that had just been made but not Applied yet. New port settings will only take effect after pressing **System -> Save & Reboot**.

HTTPS

HTTPS protocol allows creating a secure channel over an insecure network in order to protect the data sent between the camera and its counterpart. Two things are required to have a secure communication – encrypted data, and verified counterpart of the communication. To make sure that the messages are being sent and received from true counterpart, the certificate is needed.

There are two methods to create certificates – **Certificate Signing Request (CSR)** and **Self-Signed Certificate**.



Certificate Signing Request (CSR): User uses a signed certificate issued by trusted Certification Authority (CA).

Self-Signed Certificate: User wants to use the certificate created and issued by user himself.

Press **Create** or **Create Self-Signed Certificate** button and configure settings in the pop-up screen to install the certificate.

Note that the new setting will only take effect after **Save & Reboot**.

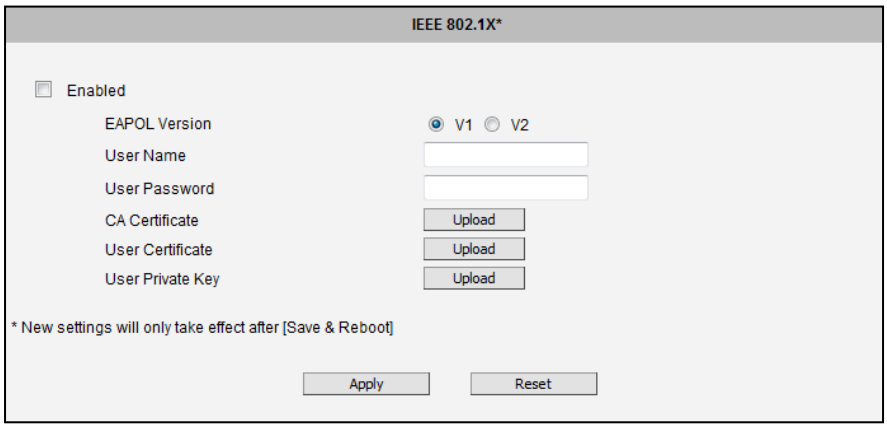
IEEE 802.1X

IEEE 802.1X **IEEE 802.1X** is an IEEE standard for port-based Network Access Control. 802.1X authentication involves three parties: a supplicant, an authenticator, and an authentication server.

The supplicant is a client device (such as an IP camera) that wishes to attach to the LAN/WLAN. The authenticator is a network device, such as an Ethernet switch or wireless access point; and the authentication server is typically a host running software supporting the RADIUS and EAP protocols.

The authenticator acts like a security guard to a protected network. The supplicant (i.e., client device) is not allowed access through the authenticator to the protected side of the network until the supplicant's identity has been validated and authorized. An analogy to this is providing a valid passport at an airport before being allowed to pass through security to the terminal. With 802.1X port-based authentication, the supplicant provides credentials, such as user name / password or digital certificate, to the authenticator, and the authenticator forwards the credentials to the authentication server for verification. If the authentication server determines the credentials are valid, the supplicant (client device) is allowed to access resources located on the protected side of the network.

Please **enable** IEEE 802.1x and configure settings on the screen below. Note that the new setting will only take effect after "Save & Reboot".



EAPOL Version V1 and V2 are the 802.1X communication types. **User name** and **User password** area created by user and set in RADIUS server. **Certificates** and **Private Key** are provided by RADIUS Server.

If certificates or private key exist already, there will be a **Remove** button behind these items, in order to remove these items when necessary.

After changing any of the items above, press **Apply** to save the changes. The **Reset** button undoes the changes that had just been made but not Applied yet.

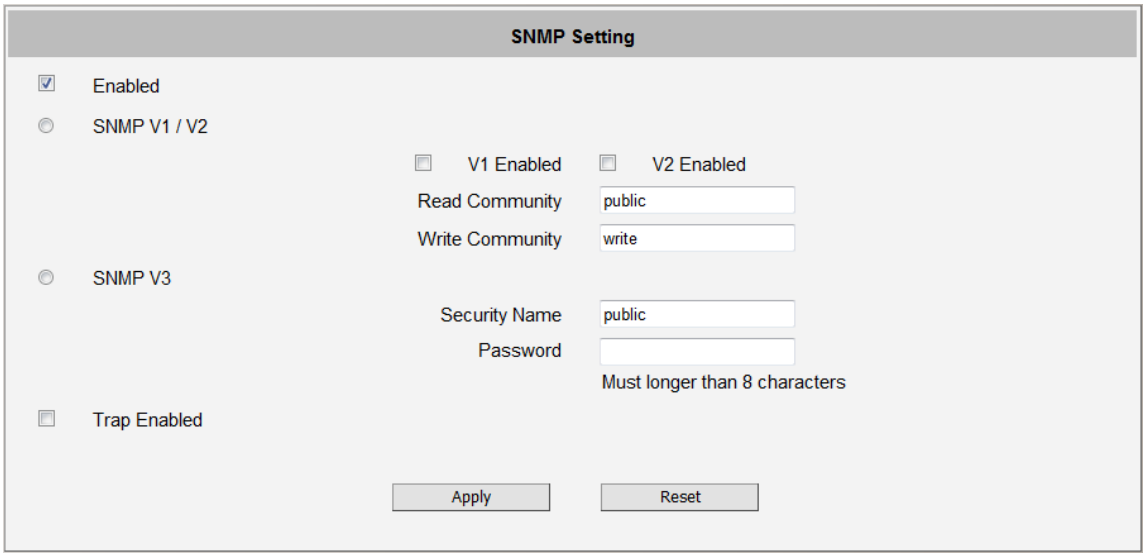
SNMP Setting

The **SNMP Setting** item displays the SNMP configuration page.

SNMP provides an easy way to manage network devices. The main features are:

1. Monitoring device uptime
2. System detail description. (Ex: model name, model description and firmware version.)
3. Collect interface information. (Ex: MAC address, interface speed, local port.)
4. Measuring network interface throughput.

To use SNMP, just **enable** SNMP function in the camera (SNMP agents) and run SNMP management software in server (NMS: Network Management Station) to connect to the devices.



The SNMP agent supports versions V1, V2 and V3. SNMP V1 is the initial implementation of SNMP. SNMP V2 is proposed to enhance the performance of management, such as the communication of server and devices, the confirmation of information delivery and receipt. Primary additions in SNMP V3 concern security and remote configuration enhancements.

SNMP V1/V2 uses “Community” name as password to authenticate identity. “Read Community” is the password for server to get information from devices. “Write Community” is the password for server to edit values on devices. The default is “public” for Read Community and “write” for Write Community. Of course, you can set any other password as your read/write community.

You can enable V1, V2 or both. Click “**Apply**” after you’ve completed setup.

The security method of **SNMP V3** uses account/password for authentication. “Security Name” is the account name to be used with your “Password”. The default security name is “public” and the password must be at least 8 characters long. You also can set any other security name or password. Click “**Apply**” after you’ve completed setup.
SNMP function is now enabled. You may now install and run the SNMP management software on computer server.

SNMP Trap Usage:

SNMP traps enable notifications from devices. Devices may send message to the management server whenever significant events occur such as cold start, warm start and authentication failure. The manager will get the information immediately and take action if necessary.

Cold start means device reboot by power disconnection. **Warm start** means device reboot by firmware without power disconnection. If there other parties attempt to connect to the device with wrong security password under SNMP V1, V2 or V3 setting, the device will send an **authentication failure** message to the management server.

To enable SNMP Trap function in the camera, type the IP address of the computer running the SNMP management software and type trap community as password to allow server to get trap message from device (Default is public). Select available traps and click “**Apply**”.

Camera’s SNMP offers following information:

Group	Description
System	Provide general information about the managed device. *Ex: system description, system name.*
Interface	Provide general information from the physical interfaces. *Ex: interface speed, MAC address.*
Address Translation	Provide information about the mapping between network addresses and physical addresses for each physical interface *Ex: The IP/MAC addresses to connect to the managed device.*
IP	Provide the status and operation of Network Layer (Layer 3).

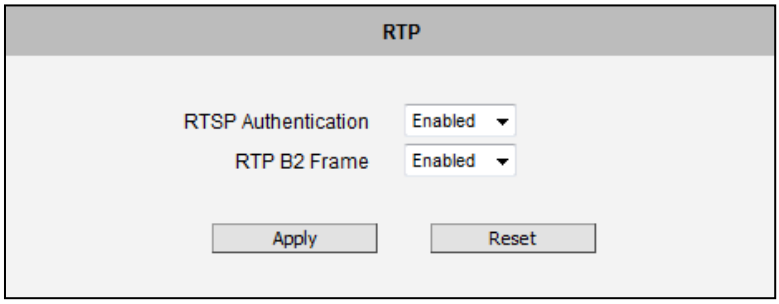
	Ex: the information and traffic flow of received/delivered package.
ICMP	Provide the status and statistics of ICMP. *Ex: amount of receive/error message of ICMP.*
TCP	Provide the status and operation of Transport Layer (Layer 4) using TCP protocol. *Ex: TCP Local Port, incoming/outgoing TCP segments.*
UDP	Provide the status and operation of Transport Layer (Layer 4) using UDP protocol. *Ex: UDP Local Port, in/out datagram.*
SNMP	Provide the related statistics through SNMP

RTP

The **RTP** section allows user to configure RTP Settings.

If the **RTSP Authentication** is "**Enabled**", then the RTP streaming will require account name and password authentication.

If the **RTP B2 Frame** is "**Enabled**" then the B2 frame is added to every video frame, containing additional information, such as **motion detection status on each frame, digital input and digital output levels, passive infrared status, other video intelligence data, frame counter, frame-rate mode and the frame-rate, bitrate, resolution, timestamp and much more**. The user side can operate with video data easily, including event management, storage consumption estimation, image resizing for preview, etc.



After changing any of the items above, press **Apply** to save the changes. The **Reset** button undoes the changes that had just been made but not Applied yet.

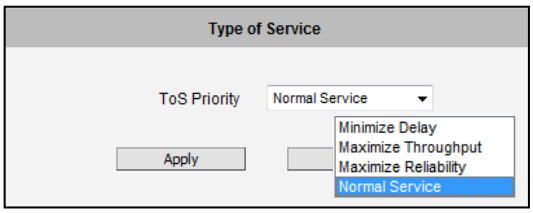
Network (ToS, UPnP, Bonjour, ONVIF)

The section Network contains the controls for following functions:

- Type of Service
- UPnP
- Bonjour
- ONVIF

Type of Service

The “Type of Service” provides 4 options to define the priorities of how the data from the camera should be handled by the routers that support ToS concept. By the default, the ToS priority is set as “Normal Service”.



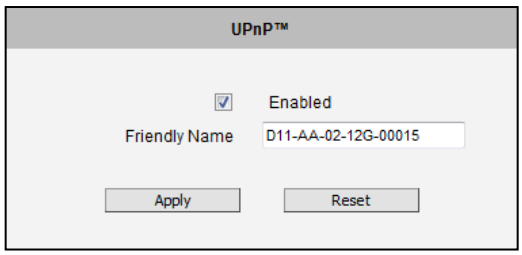
For special priority arrangement, there are 3 more options:

- Minimize Delay
- Maximize Throughput
- Maximize Reliability

After changing any of the items above, press **Apply** to save the changes. The Reset button undoes the changes that had just been made but not Applied yet.

UPnP™

The section **UPnP™** provides the option to enable or disable the Universal Plug and Play capability of the camera. Having the UPnP™ enabled allows the other network devices to seamlessly discover it on the network for convenient identification and access.



The **Friendly Name** is a human-readable name for the device that will be displayed when the camera is found. By default, the serial number of the camera is used as a friendly name; however, the user can modify the name according to the project needs.

After changing any of the items above, press **Apply** to save the changes. The Reset button undoes the changes that had just been made but not Applied yet.

Most of the Windows-based computers have the capability to discover the devices that support UPnP™. Below is the example of Windows 7: by clicking on the **Network** icon of **Windows 7**, the PC will discover the cameras instantly.

Bonjour

The section **Bonjour** provides the option to enable or disable the ability of the camera to be discovered by the other network devices using Bonjour protocol, developed by Apple Inc. Both Bonjour and UPnP serve the similar purpose – to discover devices conveniently.

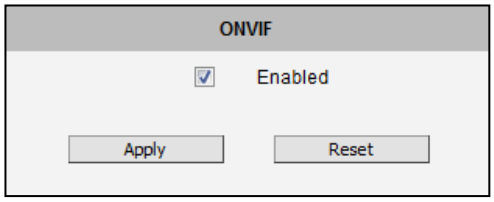
Similarly to UPnP, the human readable **Friendly Name** can be defined by the user. That name will be displayed when the camera is found in the network. By default, the Friendly Name is the serial number of the camera; however, the user can modify the name according to the project needs.

After changing any of the items above, press **Apply** to save the changes. The Reset button undoes the changes that had just been made but not Applied yet.

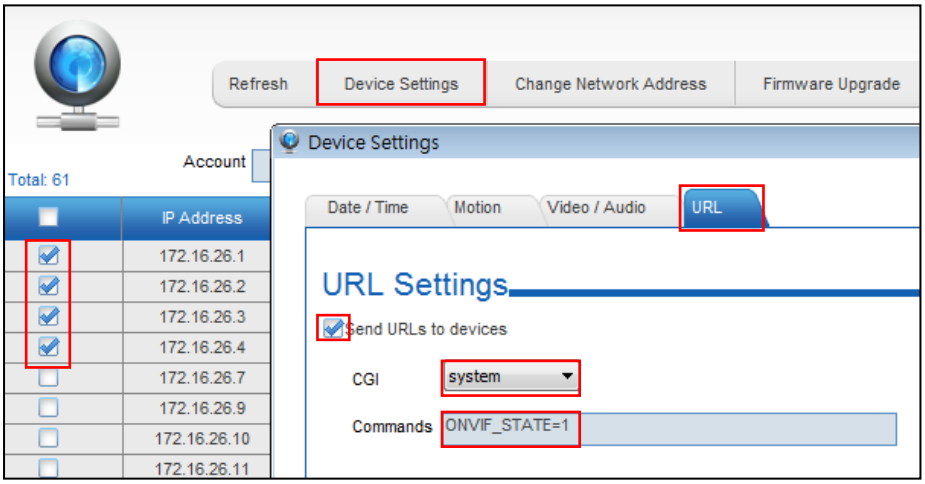
ONVIF

The camera with given firmware is ONVIF 2.2 compliant. By default, the ONVIF function is disabled.

To enable to the ONVIF support, check the box and press **Apply**.



If you need to activate ONVIF on multiple cameras conveniently, you may use the IP Utility instead, using **system** cgi and **ONVIF_STATE=1** as URL command.

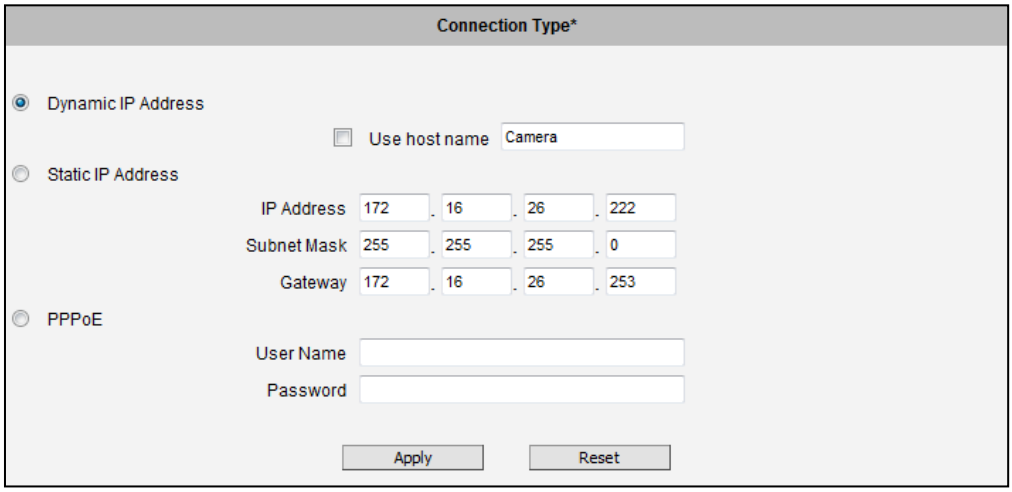


IP Settings

The section **IP Settings** provides the options to define how the camera would obtain its IP address; and to which DNS server should the camera connect to, in order to resolve domain names.

Connection Type

The sub-section **Connection Type** allows defining the method of obtaining the IP address of the camera. By default, the camera is in **Dynamic IP Address** mode and attempts to get the IP address from a DHCP server. If such attempt fails after several seconds (for example the DHCP server does not exist), the camera will automatically assign itself an IP address, listed under Static IP Address.



Host Name is used to identify the camera by a DHCP server. In some networks with very strict security policy, it is required that all the network devices should have their host name, and when the devices attempt to access the network by requesting an IP address from a DHCP server, the DHCP server would check if the host name is among the allowed devices. On this page, it is possible to edit the Host Name and enable or disable the use of host name.

Most installation projects include clear network topology and static IP addresses for each camera. In such cases, you can change the camera to **Static IP Address** mode and modify the **IP Address, Subnet Mask** and **Gateway** accordingly.

In some rare cases, the camera may be connected to the control center over Internet. Usually,

the most cost efficient way is to use ADSL connection with **PPPoE**. To avoid the unexpected changes of IP addresses by Internet Service Provider upon the restart of the camera, it is recommended to activate a DDNS service for such scenario, and let the control center connect to the camera by the domain name instead. Please refer to the DDNS section for more details.

To set the camera in PPPoE mode, set the radio button to PPPoE and key in the User Name and Password, provided by Internet Service Provider.

After changing any of the items above, press **Apply** to save the changes. The Reset button undoes the changes that had just been made but not Applied yet.

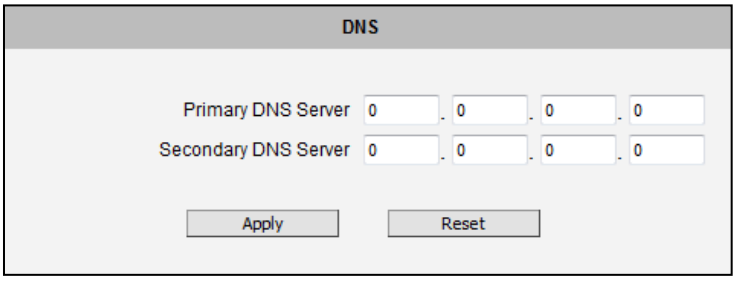
New IP address settings will only take effect after pressing **System -> Save & Reboot**.

DNS

The section **DNS** allows setting up the Domain Name Service for the camera. The camera will connect to the DNS server when there is a need to resolve a domain name for sending data to.

The most common usage is the ftp or e-mail server in the Event Handler section is defined by using domain names. Without having DNS service configured, the camera would not know how to resolve the domain names of FTP or e-mail servers.

It is possible to configure both **Primary** and **Secondary DNS servers**. The Secondary DNS Server will be used when the connection to the Primary DNS Server fails.

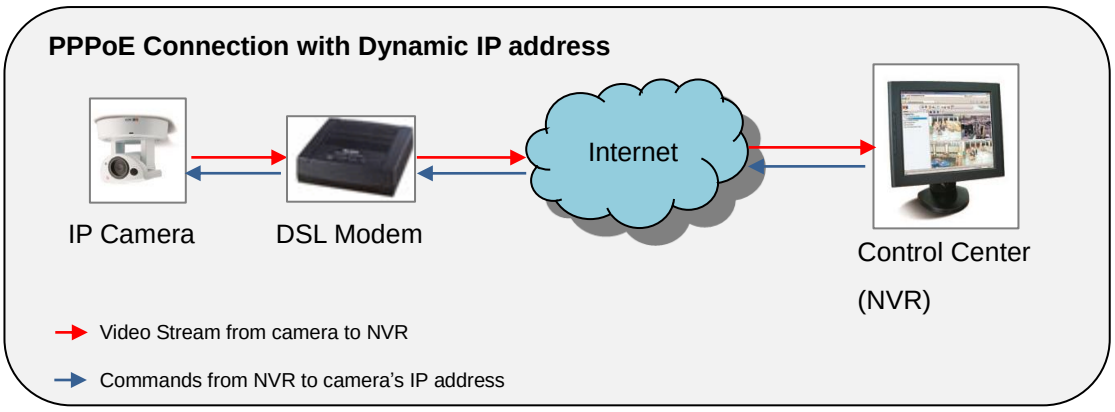


After changing any of the items above, press **Apply** to save the changes. The **Reset** button undoes the changes that had just been made but not Applied yet.

DDNS

DDNS There are surveillance solutions that consist of single cameras scattered over a wide territory, therefore each of those cameras should be connected to Internet in order to become accessible by Control Center. For example, the chain stores, bus stops, currency exchange booths, etc.

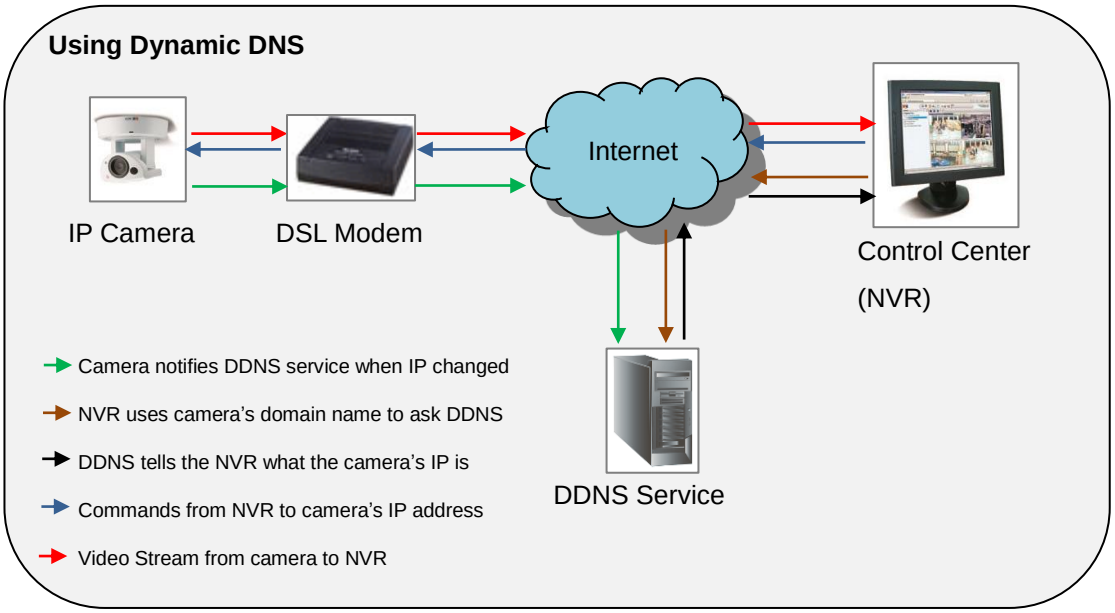
In such cases, one of the practical networking solutions is to use DSL modem on camera site and let the camera obtain the dynamic IP address from the Internet Service Provider through the DSL modem using PPPoE connection, which is much more cost-effective than applying for static IP address.



However, there is one drawback in this solution – in order to do the remote surveillance from the Control Center, the NVR Server in the Control Center has to know the address of the IP camera at all times in order to get the video stream from the camera. If the camera's network connection has been reset for any reason, the camera will get a new IP address through DSL Modem, which may be different from the previous one. NVR will not know about this change, and the connection between the camera and NVR will fail.

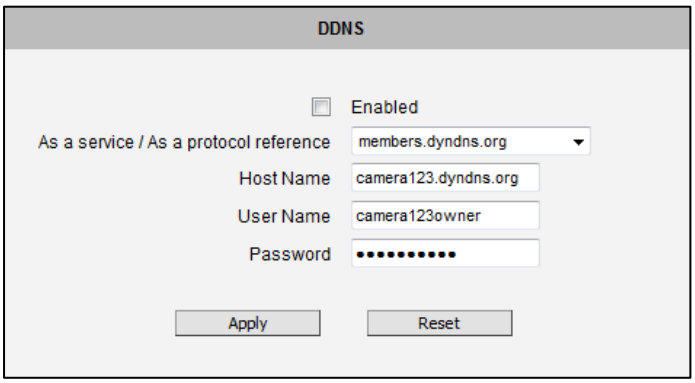
There however exists a solution that makes sure the NVR can find the camera even if the camera IP changes frequently. Our cameras support **Dynamic DNS** or **DDNS** service that allows frequently changing IP be mapped to a certain unchangeable domain name. The mapping database and its updating engine are hosted in one of the Dynamic DNS servers, most of which offer basic services for free, such as www.dyndns.org.

How does it work? Look at the graph below.



Every time the IP camera gets an IP that is different from previous one, it notifies the public DDNS Service about the change. The DDNS Service updates its database immediately, mapping the assigned domain name (for example *camera123.dyndns.org*) to the new IP address. In NVR settings, only the domain name (*camera123.dyndns.org*) is used to identify the camera. Every time when NVR needs to connect to the camera, it asks from DDNS Service what the current camera's IP is. The DDNS Service instantly responds to NVR and tells it the camera's IP. Now NVR will use the IP of the camera to connect to the camera and the video stream from the camera to NVR can be initiated.

As a result, NVR can always find the IP camera regardless of frequently changing IP address of the camera. Since there are so many public DDNS Services available for free, the PPPoE-based connection is really a good and low-cost solution for single-camera sites.



To activate DDNS, please check the “**Enabled**“. Select the service reference, input the **Host Name** (the domain name given to the camera by DDNS service, **User Name** and **Password** of the DDNS server account.

You will get the needed Host Name, User Name and Password information from the DDNS service provider once you have registered an account there and requested a domain name for your camera.

After changing any of the items above, press **Apply** to save the changes. The Reset button undoes the changes that had just been made but not Applied yet.

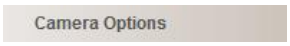
Video & Audio

The section **Video** or **Video & Audio** (for audio supported cameras) provides the options to adjust the video quality, configure the streaming details of the camera, and audio settings (for Audio supported cameras only), which will be described in the succeeding pages.

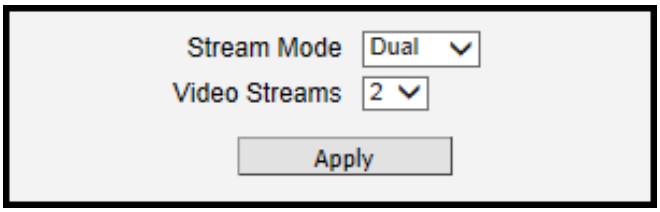
The default settings of the camera are sufficient for most environments and the video adjustments are not necessary. The following sections explain the ways to configure the video quality or streaming details in case it is required to do so.

The **[+]** mark before Video indicates that the list can be expanded by clicking on it. Once expanded, the list can later be collapsed again by clicking on the **[-]** mark.

Camera Options



In general, the **Camera Options** submenu allows users to set the **Stream Mode** and **Video Streams** properties. By default, dual-stream mode is enabled on the cameras. Some Intelligence Video Surveillance (IVS) systems allot two (2) channel licenses when connecting to the cameras through Onvif. To avoid this from happening, users can select the **Single** from **Stream Mode** or set the number of **Video Streams**.



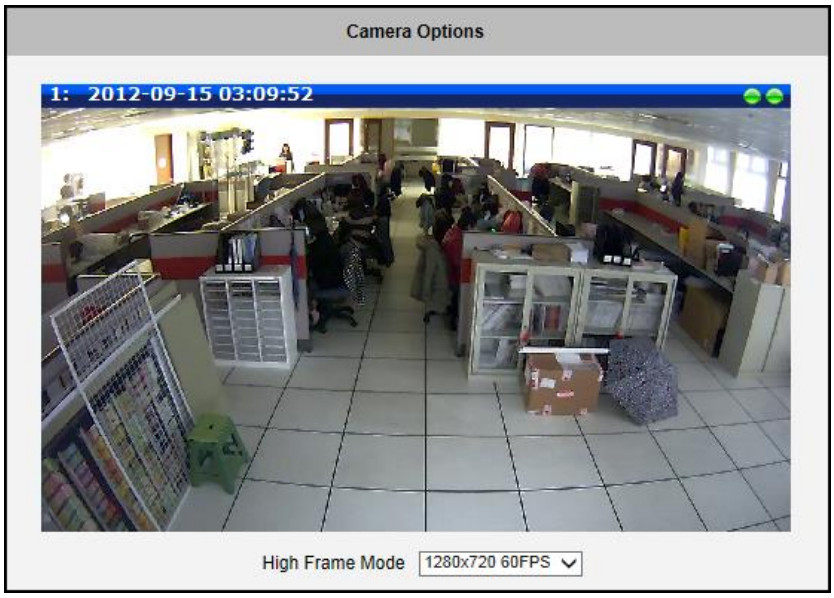
In some types of cameras, other stream mode options are available, such as ePTZ, Fisheye, etc. In this case, select the desired **Stream Mode** and set the **Video Stream** to 1 to ensure that IVS will only use one channel license.

After changing any of the items above, press **Apply** to save the changes.

Also, depending on the camera type, the parameters on the **Camera Options** screen vary. Other parameters that can be configured are explained in the succeeding pages.

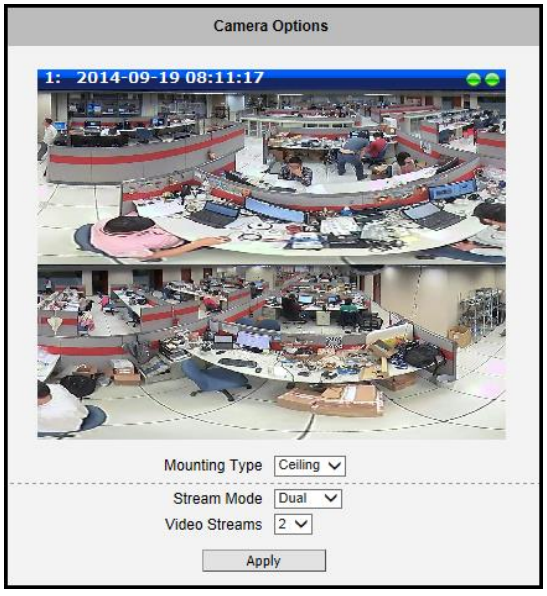
Camera Options of 1.3MP Cameras

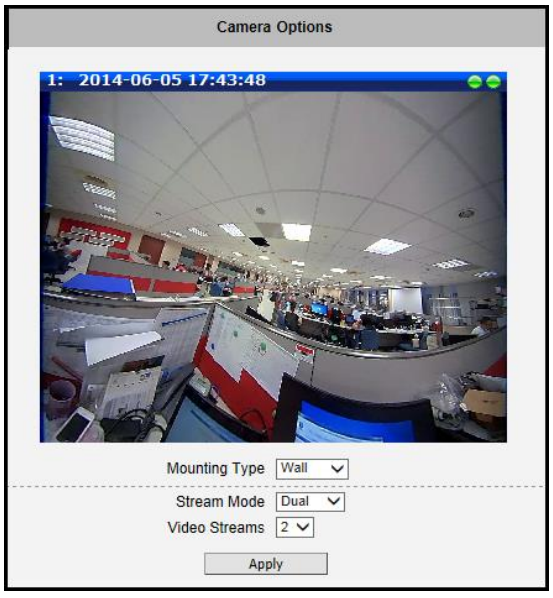
Cameras with 1.3MP resolution have a high frame rate mode of 60fps. By default, high frame mode is disabled. To enable this feature, select the maximum resolution and frame rate on **High Frame Mode**, some video settings such as Exposure and White Balance, etc. will be automatically configured. This configuration will automatically be set as the video stream 1 and the original configuration of stream 1 will now be video Stream 2.



Camera Options of Fisheye Cameras

Choose the **Mounting Type** according to how the camera is mounted to display the appropriate view. There are two options: **Ceiling** or **Wall**. For **Ceiling** mount, a double panorama is shown on the window, showing the upper and lower hemisphere of the video. For **Wall** mount, a single panorama view is shown.





Camera Options of Hemispheric Cameras

Single and Dual Stream Mode

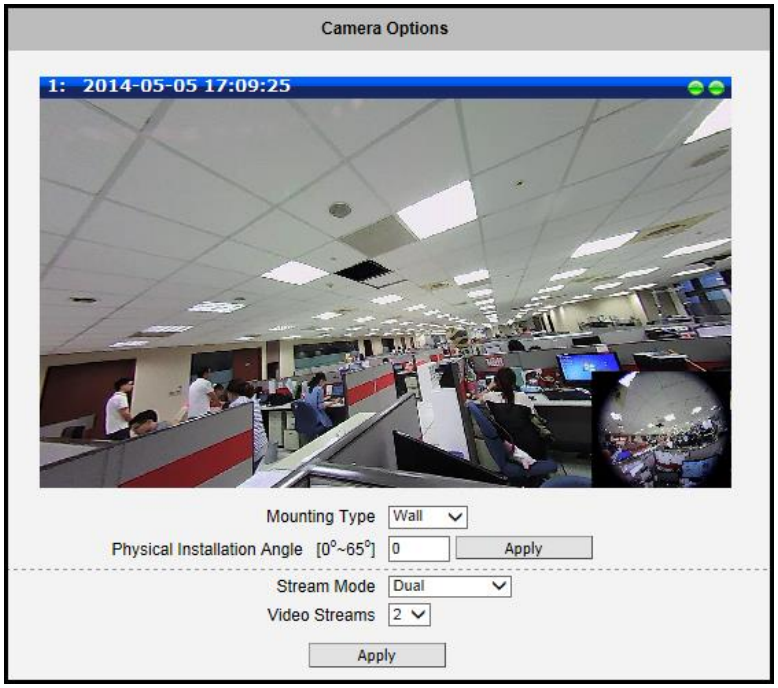
Choose the **Mounting Type** according to how the camera is mounted to display the appropriate view. There are two options: **Ceiling** or **Wall**.

For **Ceiling** mount, a double panorama is shown on the window, showing the upper and lower hemisphere of the video.

Parameters	Description
Ceiling Mounting Type	
Rotation Degrees per Click	This function allows users to specify a rotation angle and rotates the both the top and bottom panorama views when the rotate icons are clicked. The original fisheye view remains the same.
Top: Tilt Angle [0º~90º]	Specify the tilt angle of the top panorama view, then click **Apply** to tilt the viewing angle. By default, the tilt angle is set at 90.
Bottom: Tilt Angle [0º~90º]	Specify the tilt angle of the bottom panorama view, then click **Apply** to tilt the viewing angle. By default, the tilt angle is set at 90.

After changing any of the items above, press **Apply** to save the changes.

For **Wall** mount, a single panorama view is shown. Adjust the **Physical Installation Angle** to do proper dewarping based on the newly defined center of the view.



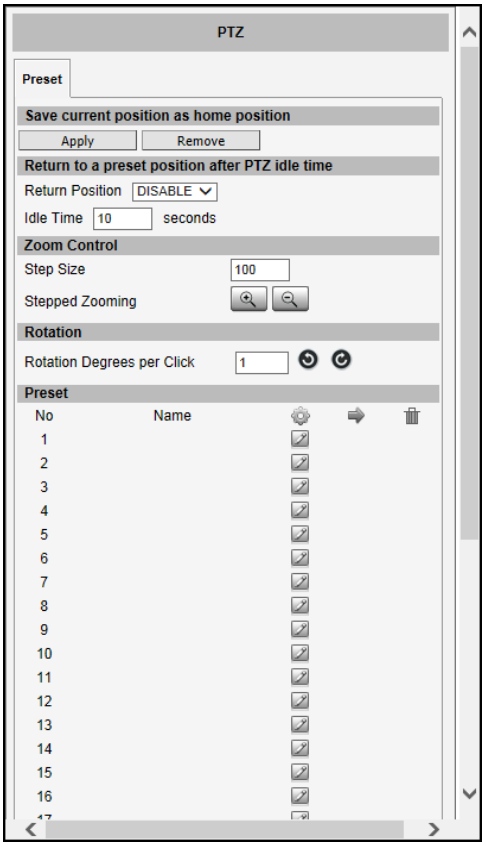
Type	Description	Physical Installation Angle
	Not using the 10° Hemispheric Camera Wall Mount	0 degree
	With 10° Hemispheric Camera Wall Mount	10 degree

After changing any of the items above, press **Apply** to save the changes.

ePTZ Mode

ePTZ mode of Hemispheric Camera works in similar way as optical PTZ function in Speed Domes. As the camera receives commands from remote client, it changes the direction of the view or zooms in or out digitally. The stream coming out from the camera represents the current viewing direction of the camera, not the panoramic view.

If you are using hemispheric camera in ePTZ mode, this screen is available by clicking on PTZ button in the **live view screen**. Mouse PTZ is enabled at the same time.



You can configure up to 32 Zoom presets below. Just click Set, enter the name and move position to what you desire, then click set again. You can instantly ask the camera to go to that zoom and focus position by clicking on the Goto button.
Click Delete to remove this zoom preset point from camera memory.

You can use ePTZ in live view by moving the mouse over video and clicking on the video anywhere you like. Wherever you click, that point will become new “center” of the view. This is how you “pan” and “tilt”. You also can rotate the view via PTZ panel if you like.

To zoom in or out under ePTZ mode, use the scroll wheel of the mouse

Preset Tour

After you set the Preset Point, the Tour function will be enabled. See ***How to Set Touring Preset Points*** on page 24 for more information.

NOTE: Home position has to be set again after changing the installation type, the motion detection configurations and PTZ configurations like preset points.

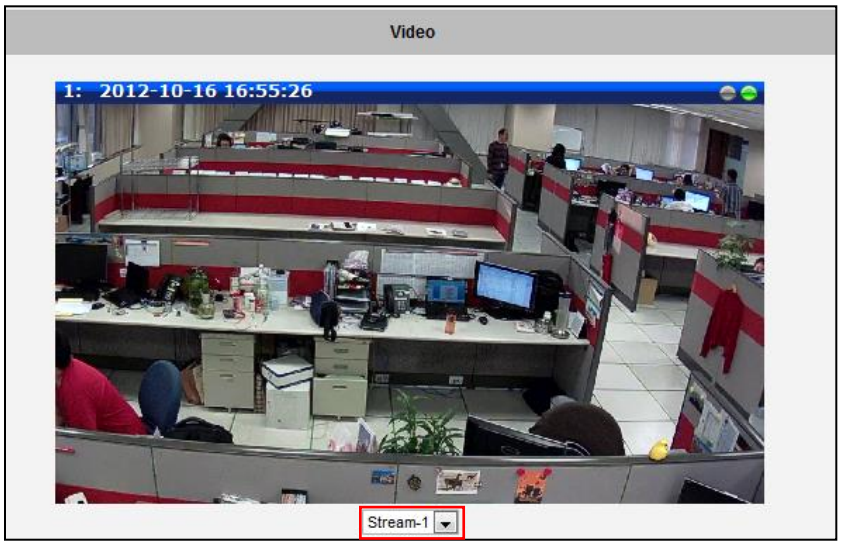
Fisheye View

This mode shows the camera view as though viewing from a fish's eye with the whole viewing angle in sight but details may be too small and not be seen clearly.

Video

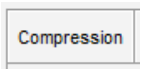
The sub-section is also named **Video**. For Audio supported cameras, there will also be a sub-section named Audio. The video section is divided into tabs. The functionality of each tab is explained separately below.

Upon opening the sub-section named Video, the live view of the Stream 1 of the camera will appear. Since the camera is a dual stream device, it is possible to see how each of the 2 streaming configurations looks like, by selecting either **Stream-1** or **Stream-2** under the live video window.



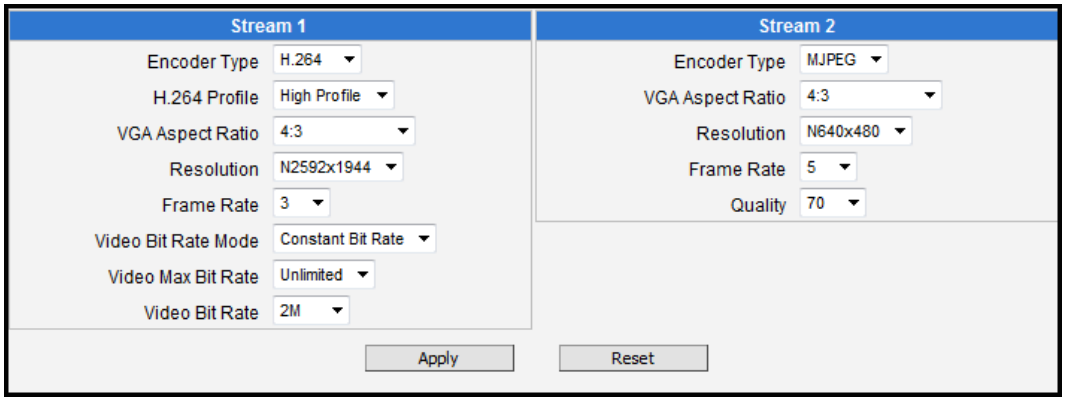
Usually, Stream-1 is configured to be high quality video with maximum resolution and frame rate for recording purposes while Stream-2 is usually a moderate quality stream for live view purposes of the VMS, to reduce VMS computing power during video decoding of multiple channels.

Compression

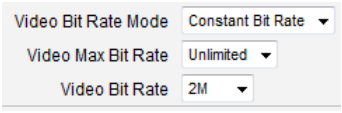
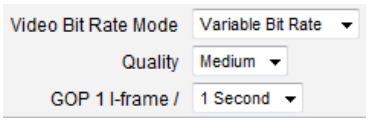


The section “Compression” allows the user to define the compression settings of the video stream 1 and stream 2. The purpose of compression is to reduce the bandwidth and VMS storage consumption.

Usually the stream 1 is configured to be the best quality stream for NVR recording purposes while the stream 2 is configured to be with the basic quality for the live view of NVR, to minimize the computing power of NVR used for video decoding.



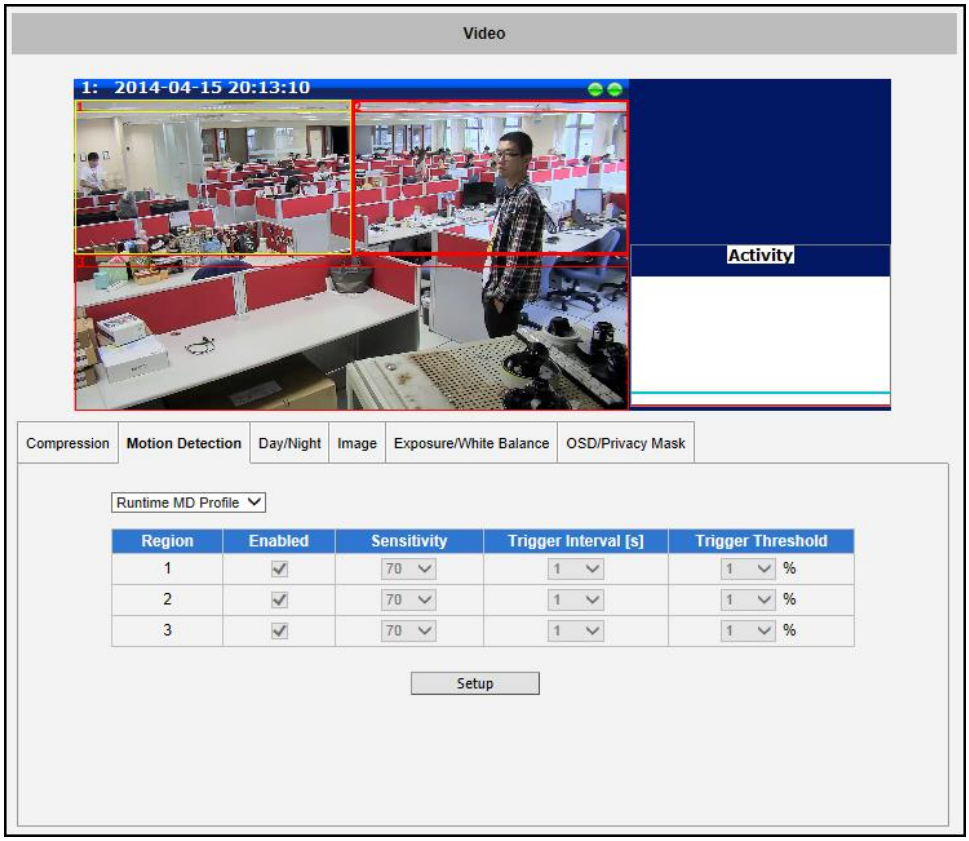
Parameters	Description
Encoder Type	There are two encoder types available: H.264 (High Profile) and MJPEG.
H.264 Profile	This item is available only if the Encoder Type is H.264. The H.264 Profile defines the video compression scheme: **High Profile**, **Main Profile**, and **Baseline**. These schemes vary from least compressed, **Baseline**, to most compressed, **High Profile**. By default, the H.264 Profile is **High Profile**, which provides the most compression with the best video quality, but more computing power. Some third-party video management system has longer latency or takes more time to decode High Profile compression scheme, in this case, you can select **Main Profile** or **Baseline**. In order to get the same video quality, you can select a higher bit rate with lower compression; this is the same as having a lower bit rate with a High Profile. For example, a video on High Profile with 2M bit rate will have the same video quality as a video with Baseline Profile at 3.5M bit rate.
VGA Aspect Ratio	It is used to define the aspect ratio of VGA stream – it can be either 4:3 ratio (640x480) or 16:9 ratio (640x360). When “Auto Detected” is chosen, the VGA stream will follow the ratio of the higher resolution stream, to ensure the identical view of stream 1 and stream 2.
Resolution	Depending on the camera model, the number of available resolutions may be different. The default resolution setting of the camera may not necessarily be the maximum resolution of the camera. If the user wants to use the maximum resolution, it is possible to do it here. The maximum possible resolution of the stream 2 will be smaller than stream 1.
Frame Rate	Defines the amount of frames per second.
Video Bit Rate Mode *(only for H.264)*	Under “Constant Bit Rate” mode (CBR), the camera keeps the stable bitrate regardless of the complexity of the scene. Under this mode, the video quality may vary if the bit rate value is set too low. It is easier to do storage and network bandwidth consumption estimations under this mode compared to Variable Bit Rate mode. Under “Variable Bit Rate” mode (VBR), the camera will keep the video quality stable while the bit rate may occasionally go up or down,

	depending on the complexity of the scene.
Video Max Bit Rate *(only for H.264)*	Defines the upper limit of the bitrate (only available under CBR mode). The bitrate will be floating slightly under that limit. For example, if the limit is set as 2M, the bitrate will be floating around 1.6~2.0 Mbps.  If the Video Max Bit Rate is chosen as "Unlimited", then the "Video Bit Rate" selection box will appear that defines the bit rate level.
Video Bit Rate *(only for H.264)*	Under CBR mode, when Video Max Bit Rate is chosen "Unlimited", the user can define the AVERAGE bit rate. For example, if the Video Bit Rate is chosen 2M, then occasionally, the actual bit rate may go below or beyond 2M, but in the long run, the average bit rate will be very close to 2M. This mode allows the most accurate storage estimations, however, while planning the bandwidth, please consider the occasional peaks of bit rate.
Quality	H.264 Compression:  Under VBR mode, the bit rate will be floating while the video quality will be stable and follows the quality standard set by the user. The user can choose either "High", "Medium" or "Low" quality. The higher is the quality level, the more bit rate the camera will use to achieve the target quality. MJPEG Compression: The user can define the quality with the numeric scale from 1 to 100. The default MJPEG quality is 60. The higher is the quality level, the more bit rate the camera will use to achieve the target quality.
GOP *(only for H.264)*	Under VBR mode it is possible to adjust the GOP length - that is the occurrence rate of I-frames. By default, there is one I-frame per second. For example, in case of 30fps, there will be 1 I-frame and 29 P-frames every second by default. When the GOP is changed to "1 I-frame per 5 seconds", then there will be one I-frame, followed by 149 P-frames. In case of the static scenes, long GOP can further minimize the bandwidth and storage consumption.

After changing any of the items above, press **Apply** to save the changes. The Reset button undoes the changes that had just been made but not Applied yet.

Motion Detection

The section “Motion Detection” allows the user to configure the video motion detection system of the camera. Motion detection regions are based on Stream 1. By default, there are three (3) enabled pre-defined regions covering the whole camera view.



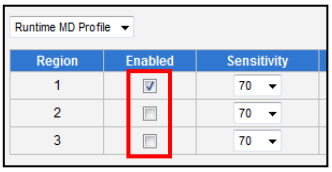
Click on “Setup” to adjust the motion detection regions or its parameters. **Microsoft Internet Explorer** browser is required to configure the motion detection regions.

There are three independently configurable motion detection regions in the camera. Each motion detection region has 6 configuration parameters:

- Enabled or disabled
- Location of the region
- Size of the region
- Sensitivity
- Trigger threshold
- Trigger interval

Enabled or disabled

Each of the 3 motion detection regions can be enabled or disabled individually. Look at the example: Only the region 1 is enabled while 2 and 3 are disabled. The disabled regions disappear from the video display.



Note that the number of the motion detection region is written in the upper left corner of the region.

Location of the region

You can move the motion detection region anywhere on the field of view by dragging the top of the motion detection rectangle as shown on the image. The motion detection regions may even be overlapping if you like.

Size of the region

By dragging the lower right corner of the motion detection region you can change the size of the region. The maximum size of the region can even be as big as the whole screen.

Sensitivity

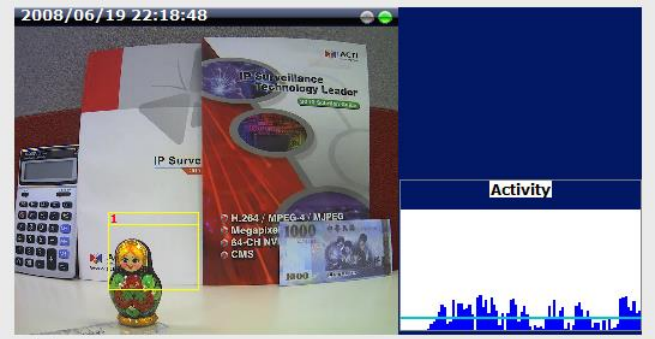
Sensitivity is the parameter that helps us distinguish actual moving targets (people, vehicles) from the slightly moving background, such as leaves of the trees waving in the wind. In order to avoid false alarms, we might want the camera be able to ignore small motion. The higher is the sensitivity level of the camera the smaller shift of the object is needed to trigger the alarm. For example, if the object within motion detection region has moved for about 1-3 pixels during two video frames, then such small motion will be discarded by camera if the sensitivity is low, and will still trigger an alarm if the sensitivity is high. In other words, you can think of sensitivity level as a ***reversed speed limit*** – the smaller is the sensitivity, the faster are the objects allowed to move without being detected.

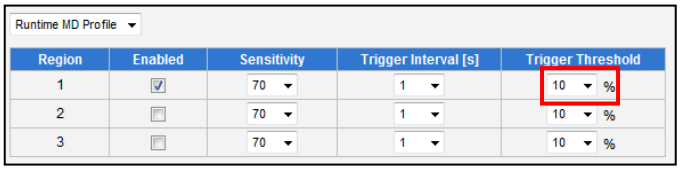
The biggest challenge of motion detection configuration is to find the settings that do not produce false alarms and at the same time do not miss any actual intrusions. The rule of thumb is: **the sensitivity should be as high as possible while not producing false alarms.** The default sensitivity level of the cameras is 70 (on a scale of 0-100) and it is a good setting for most

standard cases.

Trigger threshold

Look at the moving object entering the area of motion detection: although moving quite slowly, it caused motion activity – several pixel regions reported a motion that was faster than allowed "speed limit" of sensitivity (70).





The blue graph on the right side of the image shows how many percent of pixels within the motion detection region were considered as "currently in motion". The activity panel itself is a timeline – for each moment of time you can see the height of the blue bars. You may notice that at certain moment the tallest bars in the activity graph reached about 25% (a quarter of the total height in activity panel) – it means, 25% of this motion detection area were filled with moving pixels at that moment. By visual observation you can also see that the object standing inside the motion detection region indeed covers about 25% of its size.

What if the object is really small but moves rather fast (gets triggered by the current sensitivity level)? For example, we want to detect people but not the cat walking in the room. Although both people and cat may move with the speed that will trigger motion, they have different size of triggered pixels. For example, a human passing by the motion detection region will trigger 25% of pixels in that region while the cat would trigger only 2%. Since we want to have a real alarm in case of human or vehicle passing by while ignoring birds, cats, butterflies, mice, etc, we need a filter that can define how many percent of triggered pixels will be considered as a real alarm. This parameter is called **trigger threshold**. The default value of trigger threshold is 10%. It means, only the objects that are bigger than 10% of the motion detection region size and move faster than allowed by sensitivity level (70) will produce actual alarm.

How to choose the most optimal trigger threshold level? The rule of thumb, **keep the trigger threshold as small as possible while not causing false alarms by the moving objects that are not humans or vehicles.**

You can have different sensitivity level and trigger threshold level for each motion detection region.

In order to understand all of the above even better, please refer to the table below containing four possible combinations of settings using sensitivity level and trigger threshold percentage.

The objects listed in each cell will trigger an alarm under given settings:

	Low threshold (0-5%)	**High threshold (5-100%)**
Low sensitivity (0-65)	Big and fast Small and fast	Big and fast
High sensitivity (65-100)	Big and fast Big and slow Small and fast Small and slow	Big and fast Big and slow

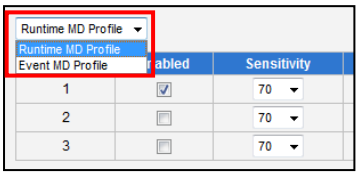
The camera's default sensitivity is 70 and threshold is 10%. By these default values, only the rabbit and the turtle would trigger an alarm while the butterfly and the snail would be ignored by the motion detection system.

Important: Please remember that changing the size of the motion detection region has an impact on the threshold – the bigger is the size of the motion detection region the smaller should be the threshold value if you want the same object size to trigger motion. For example, if you increase the motion detection region to twice the previous size, please remember to reduce the threshold to half its original value (from 10% to 5%). On the other hand, changing the location of the motion detection region has no impact on threshold.

Trigger interval

The last configuration item is the trigger interval. It is the time period from the beginning of the triggered event during which the all motion activities are ignored by the camera. This is designed to avoid needless repetitive reporting of the same intrusion. Trigger interval 20 seconds would mean that when the even happens, camera will take certain one-time actions and ignore the

continuing activity in the motion detection region for 20 seconds. When 20 seconds are over, the camera will produce a new alarm if there are still action in the motion detection region, and take actions again.



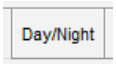
There is one more item on the Motion Detection configuration page which was not explained above – the **Profile of Motion Detection**. Think of them as **Profile 1** (Runtime MD Profile) and **Profile 2** (Event MD Profile). It means that you can configure two independent groups of Motion Detection regions with at most 3 regions in each group. Normally, the Profile 1 (Runtime MD Profile) is used as an active profile of the camera. However, in some cases it is possible to let the camera switch to Profile 2 by using the Event Handler system of the camera.

For example, you might want to have different motion detection parameters for day and night time. Then the two profiles become really handy. In such case, remember to configure the motion detection parameters for both profiles before moving on to configure the event response system.

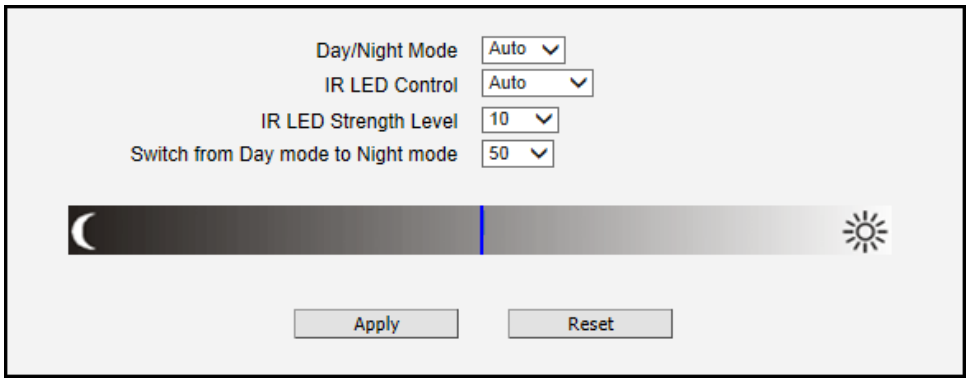
After changing any of the items above, press **Apply** to save the changes. The Reset button undoes the changes that had just been made but not Applied yet.

NOTE: For PTZ / Speed dome cameras, it is recommended to turn off motion detection when scan and tour modes are enabled to avoid false motion alarm.

Day/Night



The section **Day/Night** allows user to control the switching between day mode and night mode. This section will be displayed only for day/night models.

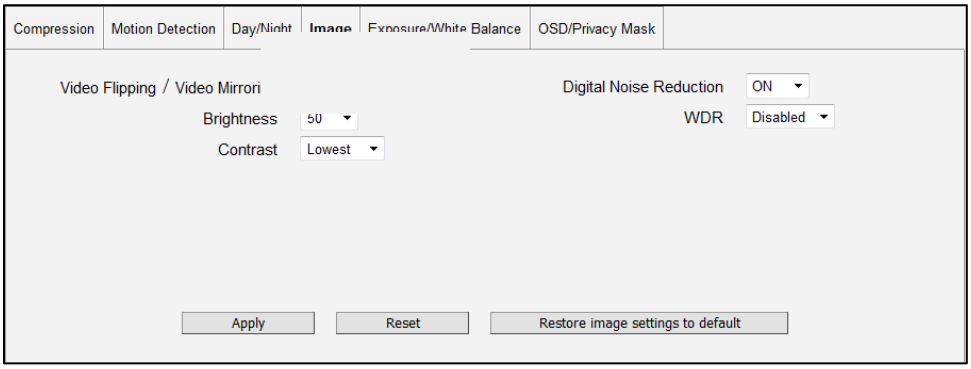


Parameters	Description
Day/Night mode	There are three modes: **Auto:** The camera will automatically switch between day mode (color) and night mode (black/white) under certain exposure level, defined by user at “Switch from Day mode to Night mode”. **Day:** The camera always stays in day mode (color) regardless of exposure level. **Night:** The camera always stays in night mode (black/white) regardless of exposure level.
IR LED Control	This feature is visible only in cameras with built-in IR LED. There are two modes: **Auto:** The built-in IR LED will be turned on automatically upon day to night switch and turned off upon night to day switch. **Disabled:** The IR LED will be off regardless of day and night mode. Zoom cameras have adaptive IR profile, which means that when IR LED Control is set to “**Auto**” (default setting), the IR LED automatically adapts to the required IR LED power as the camera is zoomed in or out.
IR LED Strength Level	This feature is visible only in fixed and vari-focal lens cameras with adaptive IR profile and when **IR LED Control** is set to “**Auto**”. The scale of **1~10** allows the user to manually define the power level of the IR LED. The higher the value, the brighter the IR LED is. Set the IR LED Strength Level according to the installation environment requirement, or set it to “**OFF**” to turn off the IR LED.
Switch from Day mode to Night mode	The scale of **0~100** allows user define the exposure level at which the day to night switch should happen. The higher is the value, the darker the environment has to be to trigger the day to night switch.

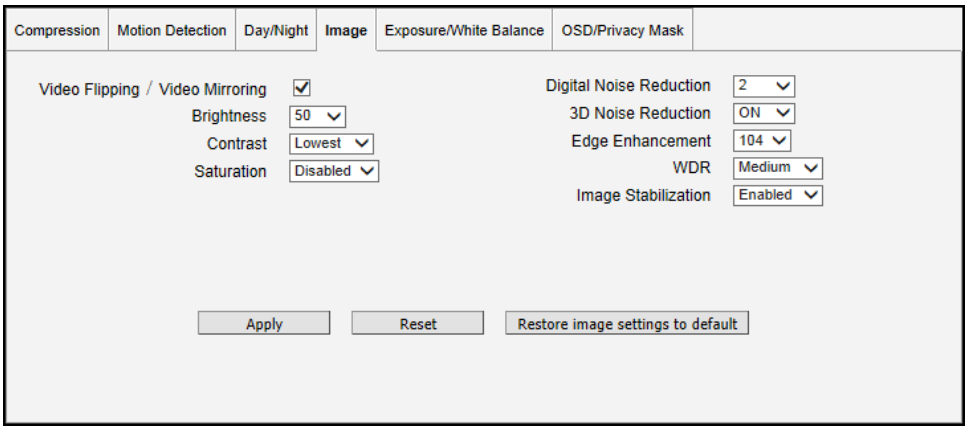
Image

The section **Image** allows user to control certain parameters of a video frame.

For D / E / B Series



For I-Series Only



Parameters	Description
Video Flipping / Video Mirroring	Check this box to flip the video up-down and left-right to achieve the 180-degree rotation effect.
Brightness	Select the Brightness value (0~100). The higher the value, the brighter the image.
Contrast	Select the Contrast level from following options: Lowest, low, medium, high, highest
Saturation (for I-series only)	Saturation makes colors appear more vivid. Select the Saturation level from the following options: Disabled, low, medium, high, highest.
Digital Noise Reduction	Turn ON or OFF the Digital Noise Reduction. When turned on, the noise on the video (especially in low light) is reduced and image will look smoother and clearer.
WDR	Choose the WDR level from following options: Disabled, low, medium, high, highest.

Parameters	Description
	NOTE: WDR is disabled and will not appear on screen if **Exposure Mode** is set to “Manual”. See *Exposure / White Balance* on page 69.
3D Noise Reduction (for I-series only)	Enable this feature for smooth and clear image. Disable this feature if the scene contains extreme details that may be smoothed over with 3DNR.
Edge Enhancement (for I-series only)	Select the Edge Enhancement value. The higher the value, the sharper the image.
Image Stabilization (for I-series PTZ / Speed Domes only)	This feature has no obvious effect under normal viewing conditions. However, if the camera is installed inside a moving vehicle, such as a train, etc., enable this feature to make the image stable even when the environment is in constant motion.

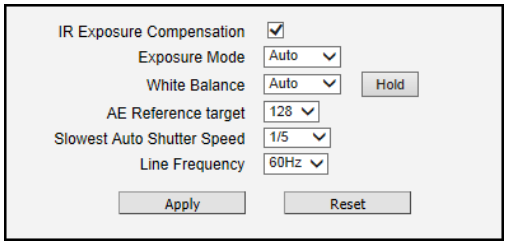
After changing any of the items above, press **Apply** to save the changes. The Reset button undoes the changes that had just been made but not Applied yet.

The button **“Restore image settings to default”** is a quick way of restoring factory default image settings without needing to reset the whole camera to factory default.

Exposure / White Balance

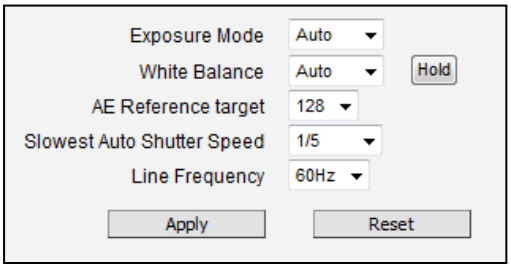
The section **Exposure / White Balance** allows the user to configure Exposure (shutter, iris and gain control) and White Balance settings. In most cases, the default settings are sufficient and no adjustment is needed. Some options will only appear under certain Exposure / White balance modes. Each mode is described in detail below.

IR Exposure Compensation – Enabled



IR Exposure Compensation is available on all cameras with IR lLEDs. This feature automatically balances the IR exposure to eliminate over-exposed images cause by too much IR on the subject. When enabled, the AE reference target is automatically adjusted to control the sensor's shutter speed and gain to compensate IR effect.

Exposure Mode - Auto



In Auto Exposure Mode, you control the image brightness by configuring the AE Reference Target and Slowest Auto Shutter.

AE Reference Target (Auto Exposure reference target) can be considered as the "Target Brightness on Sensor". The camera will use several internal parameters to achieve best quality with reference to this. **The higher this value, the brighter the overall scene, however, there may be more noise at night in such case.** The range of AE Reference Target is 1~255.

The camera will automatically control shutter speed, auto iris (if available) and signal gain to achieve the target level set by the user. If the auto iris does not exist or is already opened to a maximum size, and the image is still darker than the user defined target, it will further slow down

the shutter speed within the allowed range (set by user under Slowest Auto Shutter Speed) and increase the signal gain.

Slowest Auto Shutter Speed is the user defined threshold for slowest allowed speed of auto shutter. For example, if by default the shutter speed would vary between 1/5s ~ 1/2000s depending on the lighting conditions, then setting the Slowest Auto Shutter Speed to 1/30s would narrow down the auto shutter range to work between 1/30s ~ 1/2000s. The purpose of allowing user to define the threshold for slowest speed is to avoid motion blur caused by too slow shutter at night.

It is also important to know that very high shutter speed is not recommended for indoor solutions with artificial light that flashes with certain frequency, as it may produce flickering effect, regardless of Exposure mode.

Shutter speed choices according to environment:

Shutter Speed	1/5	1/13 1/15	1/25 1/30	1/50 1/60	1/100 1/120	1/250	1/500	1/1000	1/2000
Indoor	Y	Y	Y	Y	Y	-	-	-	-
Outdoor	Y	Y	Y	Y	Y	Y	Y	Y	Y

In extreme low light conditions, the shutter speed is slown down to get more light into one image, but not slower than the user defined threshold.

If the exposure time extends beyond the interval between frames (too slow shutter), (i.e. 1/30 second), then the frame rate will be automatically reduced. **Longer time in this value gives clearer images at night for slow moving objects, but more motion blur for fast moving objects.**

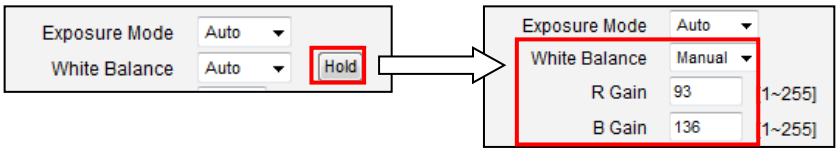
White balance refers to the capability of the camera to understand what “true white color is”. When the camera knows the true white color, then the rest of the colors will be accurate, too. While human eye can easily adapt to different lighting sources (even mixed sources, such as sun light through the window and indoor lights turned on at the same time), the camera has to understand what is the dominant light source in given scene and what is the “white color” of such light source.

By default the camera is in **auto white balance** mode and attempts to recognize the light source

and its color spectrum automatically and adjusts the image accordingly. This function works continuously in the background. It is re-evaluated for each frame, to make sure if there is any change in dominant light source (e.g. the user closes the curtains to block the sun light and turns on the indoor lights).

In most cases the auto white balance works perfectly and the user does not have to adjust anything! In some rare installation cases, especially when there are no white color objects in the field of view, and the light sources are mixed, the camera may have difficulty to identify the true white color to fine tune the rest of the colors.

In such cases, the installer can “help” the camera to understand the true colors by placing a white object (for example a piece of white paper) in front of the camera to cover the whole field of view and wait a few seconds – the auto white balance system will adjust the colors until the white paper will really look white on the display. At that moment, the user can freeze these white balance settings by pressing the **Hold** button. After pressing that button, the White Balance will switch from Auto mode to Manual mode, together with the color values captured at the moment of Hold. The user can now remove the white object from the field of view, and the colors will stay correct for given scene.



For advanced users, there is also an option to switch from Auto mode to **Manual mode** of White Balance directly and input the R Gain and B Gain values manually.

Line Frequency is the function that adjusts the shutter speed options to match with the frequence of artificial light source of given country. For example, in Europe the light frequency (due to power supply frequency of lights) is 50Hz, that is 50 flashes per second. By setting line frequency to 50Hz in such case, the shutter speed options will be proportional with light source frequency, such as 1/25s, 1/50s, 1/100s, etc.

It is necessary to have the camera’s Line Frequency adjusted according to the power frequency of the light source to avoid flickering effect.

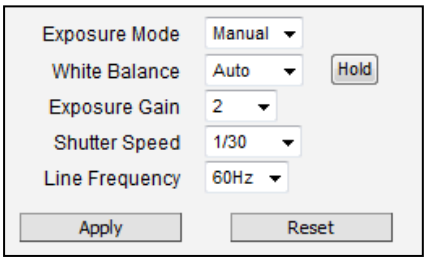
The natural light source (sun light) is a seamless flow of light – the Line Frequency setting does not matter for the cameras that are only exposed to natural light.

After changing any of the items above, press **Apply** to save the changes. The Reset button

undoes the changes that had just been made but not Applied yet.

Exposure Mode - Manual

When the lighting conditions are stable 24 hours a day, the advanced users may consider using manual exposure mode, to further fine tune the image quality in order to fulfill the special project requirements. Please note that in most cases, it is highly recommended to keep the camera in Auto Exposure mode and let the intelligent system of the camera find the best possible exposure settings instead.

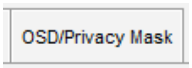


In manual exposure mode, the user can directly adjust the signal gain and shutter speed manually. The White Balance and Line Frequency controls have already been explained in the previous chapter.

NOTE: WDR is disabled in manual exposure mode (see *Image* on page 67).

After changing any of the items above, press **Apply** to save the changes. The **Reset** button undoes the changes that had just been made but not Applied yet.

OSD/Privacy Mask



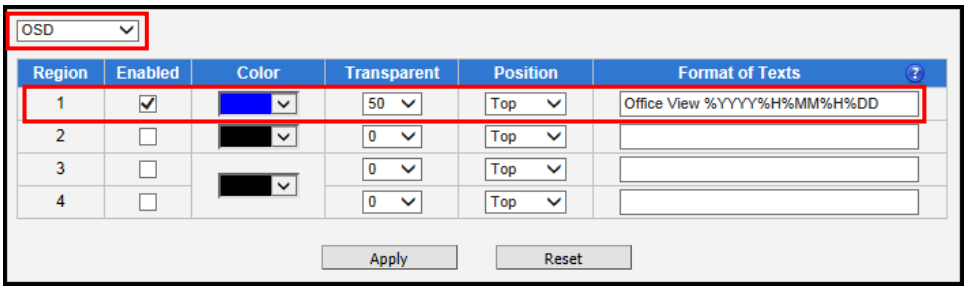
The section **OSD / Privacy Mask** allows user to do one of the two on-video operations:

NOTE: Privacy Mask is not available on zoom and PT(Z) cameras under the **E** and **B** camera series.

1. Add text to the upper or lower left corner of the video. This function is called **Text Overlay** or **On-Screen Display (OSD)**. It is possible to display the camera name, date and time, IP address or any custom text as Text Overlay. **The text is kept as small as possible and is not resizable.** The text can be read normally when the video is enlarged on the display to 1:1 ratio. The purpose of having the text so small is to provide sufficient legal evidence while blocking the smallest possible area of the video to avoid valuable video evidence being blocked by text overlay. The text will be embedded into video and cannot be removed later upon playback or export.
2. Cover up some sensitive areas of the video that should not be captured by the camera, such as manager's computer screen or bathroom entrance. This function is called **Privacy Mask.** It is possible to configure several independent regions for masking. **Microsoft Internet Explorer** browser is required to configure the Privacy Mask. The privacy masks will be embedded into video and cannot be removed later upon playback or export.

Text Overlay (OSD) Setup

It is possible to define up to 4 regions of text. If more than 1 region of text is **enabled** and positioned in the same location, then the texts will appear one below another, row by row.



In the example above, one region of text was enabled with blue color and 50% transparency, located at left lower corner and containing the text of "Office View" together with current date. The date would be automatically changing every day, according to camera's date and time settings. The result of the example configuration would look like this (Live View page, 1:1 scale):

Below is the list of characters with special meaning that can be used in the text field:

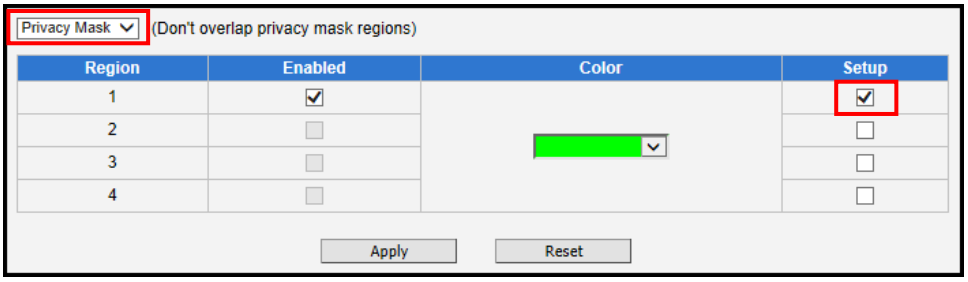
Parameters	Description
%YYYY	Year in four-digit format. For example, 2008
%YY	Year in two-digit format. For example, 08
%MM	Month in two-digit format. For example, 01 for January, 12 for December
%DD	Date in two-digit format. 01~31
%hh	Hour in two-digit format. 00~23. Note that only 24-hour indication is supported.
%mm	Minutes in two-digit format. 00~59
%ss	Seconds in two-digit format. 00~59
%H	a hyphen, "-"
%C	a colon, ":"
%X	a slash, "/"
%N	show Camera Name (It might be truncated if exceeds max OSD length)

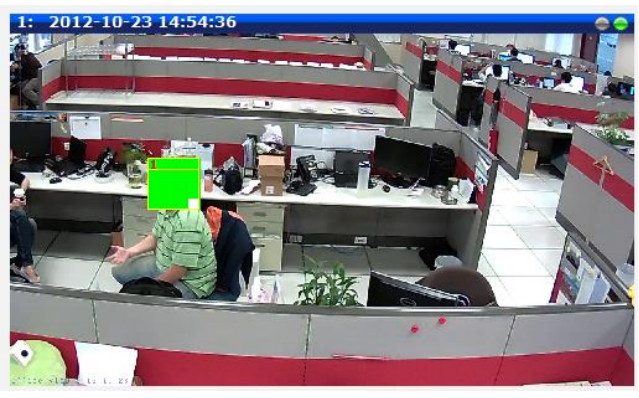
After changing any of the items above, press **Apply** to save the changes. The **Reset** button undoes the changes that had just been made but not Applied yet.

Privacy Mask Setup

NOTE: Privacy Mask is not available on zoom and PT(Z) cameras under the **E** and **B** camera series.

It is possible to set up up to 4 regions of privacy masks. The adjustment of the privacy mask region can be done when region is checked under “Setup“ column.





You may resize and drag the region the same way as the motion detection regions: upper bar that contains the number of the region can be used for

dragging the region across the video while the white box at the right lower corner of the privacy mask region can be used for resizing the region.
There are 4 pre-defined color options for privacy masks. If the user wants to use any other colors, please use URL commands to set up the privacy mask instead. To do that, please refer to the Guide that explains the use of URL commands.

When switching back to live view, the privacy mask would look like this:

For PTZ camera models, the privacy mask is dynamic. Thus, when the camera is panned to other directions, the region that is originally covered remains covered for privacy. Also, the user can only select one color for all 4 privacy masks.

Please note that the Text Overlay (OSD) and Privacy Masks will take effect for both Stream 1 and Stream 2.

After changing any of the items above, press **Apply** to save the changes. The **Reset** button undoes the changes that had just been made but not Applied yet.

Notice: It may take several seconds to update the region location on video display after pressing Apply!

On-Screen Graphics

On-Screen Graphics (OSG) is a new feature that allows placing custom image files on the top of the video as a layer. For example, it can be used as a watermark for security purposes, or a brand logo in the corner of the video image.

There is no interface within Web Configurator to configure On-Screen Graphics since it is a rarely used feature. The URL commands can be used to complete the task instead.

The image that can be used as OSG has to be in YUV format (Image raster graphics) before uploading to the camera. There are several freeware converters available that convert images to YUV format.

For example, one free trial version of YUV converter can be downloaded from Sunrayimage.com:
http://www.sunrayimage.com/download/YUVTools_3.0_trial.zip
We do not guarantee the performance, terms of usage or availability of this product. The user has to read the terms of use first and proceed with installation if the terms are acceptable.

Please note that the image should not be larger than 640x480 pixels and should contain an even number of pixels. The image, once uploaded, cannot be resized. Therefore, please make sure that you have the image with the right size before uploading to the camera.

For example, we have the BMP logo with the size 204x106 that has been converted into YUV:

When the image is ready, upload it to the camera by the following URL command:

http://192.168.0.100/cgi-bin/cmd/encoder?OSG_IMAGE

Upon successful entry of user name ans password, the following upload window will appear. **Browse** for the **yuv** file in your computer that you had prepared and press **Apply**.

When done, use another URL command to configure its position:

http://192.168.0.100/cgi-bin/cmd/encoder?OSG_CONFIG=1,0,0,240,106,EB8080,4

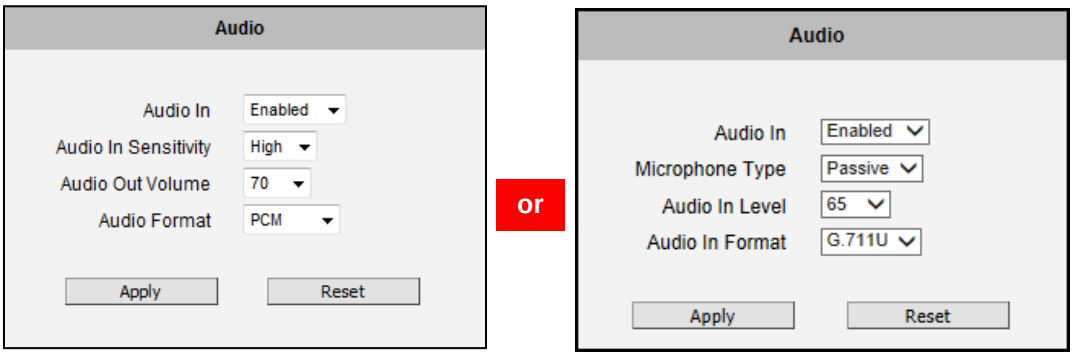
... where the 7 parameters behind OSG_CONFIG mean following:

Parameter Position	Description
1	1 means enabled, 0 means disabled
2	X position
3	Y position
4	Width of the image
5	Height of the image
6	YYUUVV value of the background color of the image that is to be blended
7	Transparency level: 0 means 0%, 1 means 25%, 2 means 50%, 3 means 75%, 4 means 100%

The result would look like this:

Audio

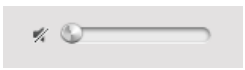
The section **Audio** is available only for audio-supported models. The user interface for audio control looks as below:



Parameters	Description
Audio In	The option “Enabled” would activate incoming audio (either line in or built-in microphone). The option “Disabled” would turn off the incoming audio. In such case, the video stream is captured without audio.
Audio In Sensitivity	Choose “High” when the target is farther away from the camera and choose “Low” when the target is near the camera. Under “High” mode, there may be more audio noise due to higher level of signal amplification. **NOTE:** Not available in all models.
Microphone Type	Select the type of microphone connected. **NOTE:** Available in vehicle-support models only.
Audio In Level	For vehicle-support models, use this function to adjust the sensitivity level of audio input. **NOTE:** Available in vehicle-support models only.
Audio Out Volume	The audio out volume level can be adjusted in the scale of 0-100. It will influence the volume level of the speakers connected to the camera.
Audio Format	Choose the compression format of audio: PCM, G.711A (*A-law*) or G.711U (*μ-law*).

To adjust the volume level of the speakers connected to the PC that runs the Web Configurator in order to hear the audio from the camera’s microphone or line-in device, go to **Live View** page and use the audio controls there:

Audio Muted:



Audio level adjusted to the maximum:

This volume control appears in user interface only when the Audio-in function of the camera has been “Enabled”.

Event

This section describes how to setup the Event Handler, which deals with how the IP devices respond to situations. Each IP device can have a maximum of 10 Event Rules. Each rule includes one single trigger, and one or many responses. Several types of responses are available. And there are multiple external servers for the device to interact with.

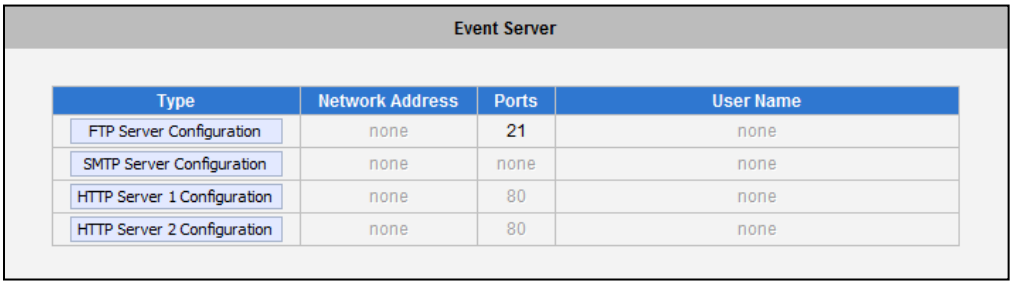
When setting up Event Handler, there are four types of settings. Event Server, Event Configuration, Event Rules and Manual Event

Click the ⊞ item before **Event** to expand the list.

Event Server

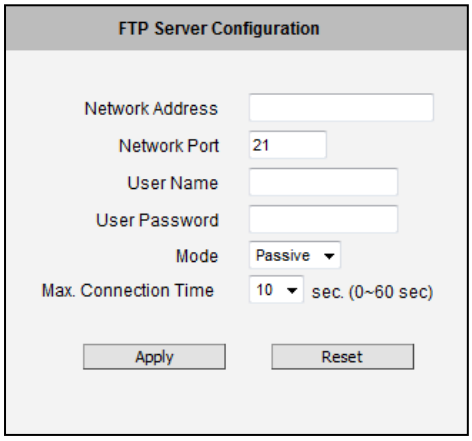
Event servers define whom the device may interact with. They can be other servers or devices on the network, or even the camera itself. **Event Configuration** sets up a list of what to tell the other party during interaction. Event list lays down the rules and conditions about when to initiate which responses from which triggers. ***The options available for Event rules are selected from the event servers and event configurations.***

Event servers are classified as FTP servers, SMTP servers and HTTP servers



FTP Server

FTP servers can receive snapshot or video uploads that are issued as part of the response from event handlers. You may setup one FTP server.

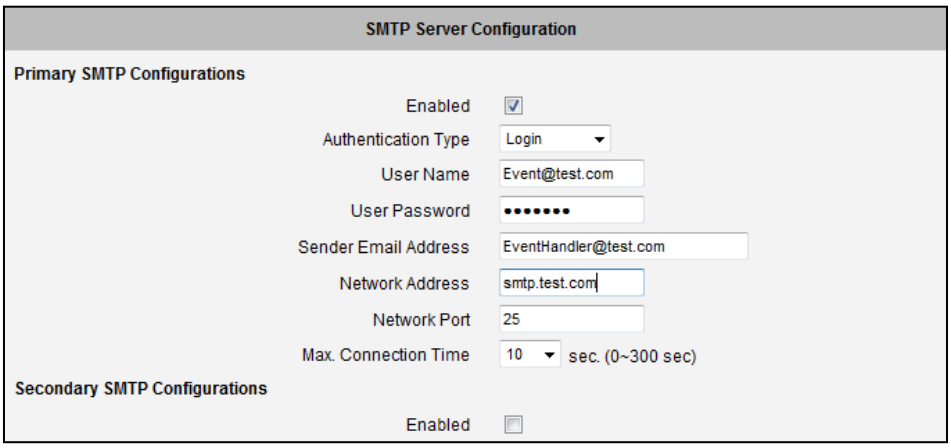


To setup FTP servers, make sure to enter the network address of FTP server, the Network (FTP) port, the User Name and Password of FTP account, Connection mode (Passive or Active) and Connection time before timeout.

After changing any of the items above, press **Apply** to save the changes. The Reset button undoes the changes that had just been made but not Applied yet.

SMTP Server

SMTP servers can send email upon request from the IP device. The email can be a simple subject and text email, or attached with snapshot / video. You may setup two SMTP servers. The device will first attempt to send the message via the Primary email SMTP server. If the first attempt fails (after the Max connecting time), then the device will attempt to send via the secondary SMTP server. If the device sends email successfully via the primary SMTP server, then it will not use the secondary SMTP server.



To setup SMTP servers, make sure to enable the SMTP account and choose the proper Authentication type. There are many types available. The default is Login. We recommend you to use Auto Detection. Available authentication types include: Auto Detection, None, Login, Plain, Cram MD5, Digest MD5 and PoP Relay. Please also enter the User Name, Password, the email address displayed as sender (can be different than the user name), Network (SMTP server) address, Network (SMTP server) Port number and Max Connection time before timeout (in seconds).

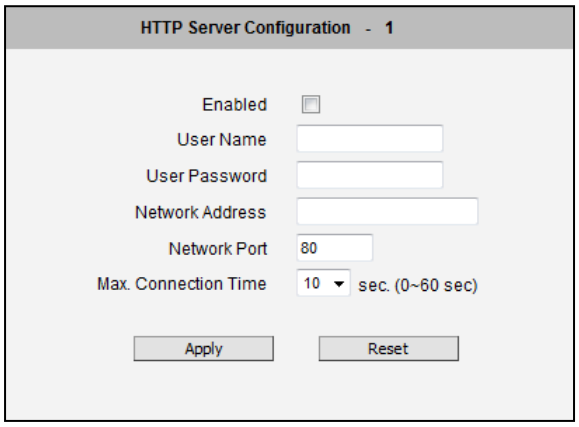
After changing any of the items above, press **Apply** to save the changes. The Reset button undoes the changes that had just been made but not Applied yet.

HTTP Server

HTTP CGI servers are programs that run on web sites or many devices. They can be custom programmed to perform a large variety of actions based upon the input. You can define which CGI server to connect to here, and the user / password required to log into the target server. The actual message / command is setup in the Notification messages / URL commands section. You may define two separate CGI servers.

IP devices are also CGI servers. This means that IP devices can now issue commands to each other, which creates endless possibilities for highly coordinated response. The IP device can also give a loopback command to itself, in effect changing almost all possible settings dynamically. For detail on the commands used to control the cameras, please contact your customer representative.

An example will help you gain a better sense of how to utilize this unique function. Camera A is a fixed camera that looks at a corridor leading to the main hall. It has a motion detection window located near the point where the corridor arrives at the large hall. Camera B is a PTZ camera located in the hall, which is usually left on auto-tour patrol. When motion activity in the motion detection region triggers MD1 in Camera A, this then in turn activates an event rule in Camera A that gives out a command to Camera B. Camera B would then swivel to the preset point where the corridor leads into the entrance and switch to higher bit rate to temporarily provide clearer image. After the event ends, Camera B will go back to its normal routine in lower bit rate.



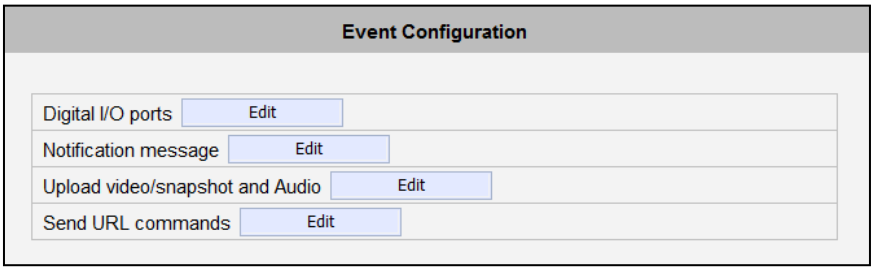
To setup HTTP servers, make sure to enable the HTTP server, enter the user name, the user password, Network (HTTP Server) address, Network (HTTP Server) port number and Max connection time before timeout (in seconds).

After changing any of the items above, press **Apply** to save the changes. The Reset button undoes the changes that had just been made but not Applied yet.

Event Configuration

Event configurations are the responses to be performed when an event is triggered. For most types of responses, you can create several different preset responses, then mix and match in event rules.

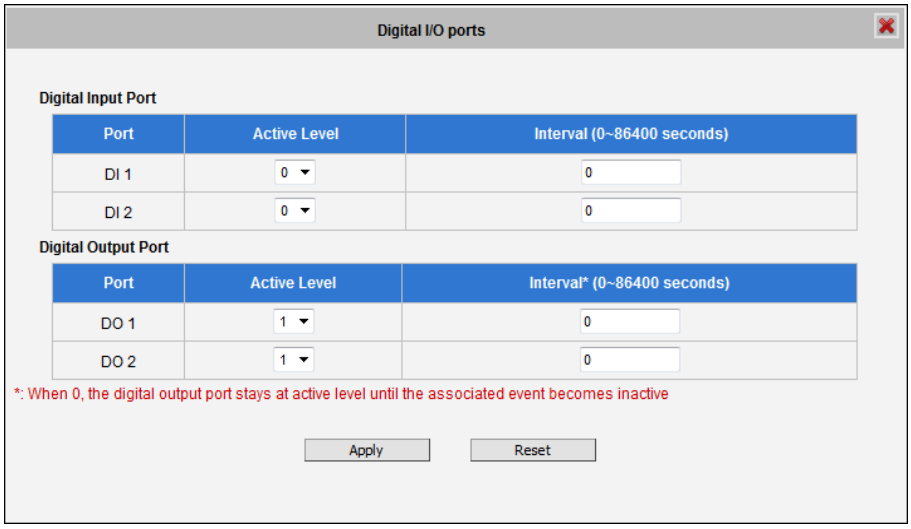
The configurable responses are classified as Digital I/O ports, Notification messages, Upload Video/Snapshot and Audio and Send URL Commands.



NOTE: Digital I/O ports appear only for the camera models that support this function.

Digital I/O ports

Digital input/output ports (select models only) are used to connect digital input (DI) and digital output (DO) devices. DI is a trigger device like a switch or sensor (e.g. “panic button”), which when pressed or triggered, notifies the camera to perform specific actions or the DO device to respond. DO’s can be alarms or lights, etc.



The Digital I/O Ports page displays the number of available DI and DO ports on the camera, which varies depending on camera model.

DI: To configure the digital input device, define the active level and trigger interval of the DI. The default **Active Level** is “0”, which means the DI device remains inactive unless triggered. A good example is a “panic button”, which always stays in inactive mode “0” until the button is pressed; when the button is pressed, its active level becomes “1” which means the DI is triggered. Active level “1” returns back to “0” (inactive mode) after the specified **Interval**. The **Interval** is the duration of time when the trigger remains in active mode which is also the minimum time interval between the previous trigger and the next. For example, if the interval is set to “5 seconds”, the DI will not respond if the “panic button” is pressed within 3 seconds after the previous trigger. To issue another trigger, press the button after 5 seconds from the previous trigger.

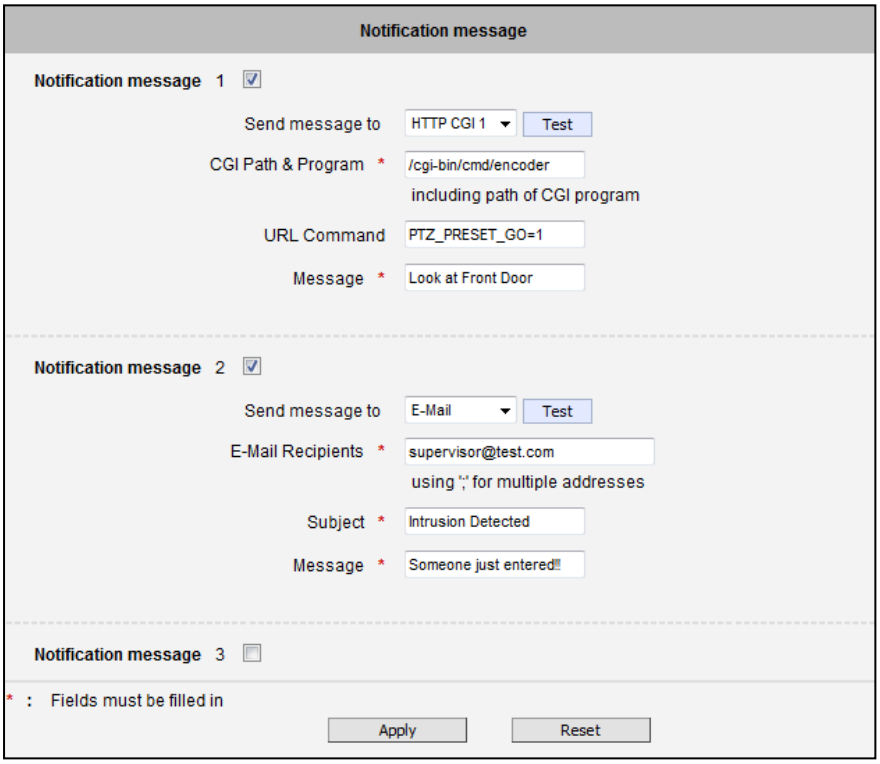
DO: To configure the digital output device, define the active level and response interval. The default **Active Level** is “1”, which means the DO will turn to active mode and respond once triggered. The duration of its response will last according to the set **Interval**. A good example is an alarm siren, wherein the siren will start sounding only when it is triggered by an event or another device like a DI. The siren will stop sounding once the set interval time elapsed.

After changing any of the items above, press **Apply** to save the changes. The Reset button undoes the changes that had just been made but not yet applied or saved.

Notification message

*Pre-requisites: **SMTP server / HTTP CGI server setup.**

Notification messages may be sent to either an email or a HTTP CGI server. If sent to a CGI server, it works the same as an URL command, but it does not allow a second message at end of event. You may configure up to three preset massages. You can configure a message, but disable it. This will allow you to keep the settings without using it, which will be useful in testing and troubleshooting.



To setup Notification Messages, make sure to enable the message and then determine what type of message to send (HTTP CGI or email).

If you are sending to CGI server, you need to enter the CGI path, the URL command itself, and an optional message.

If you are sending email, please enter the recipient E-Mail address, the email subject, and the body message.

After changing any of the items above, press **Apply** to save the changes. The Reset button undoes the changes that had just been made but not Applied yet.

Upload Video/snapshot

*Pre-requisites: **SMTP server / FTP server / HTTP CGI server setup.**

IP devices may send video recording / snapshots to your chosen server upon event. Video will be in .RAW format, while snapshots will be .JPG files. You can define up to three groups of settings to upload video/snapshot. Snapshots can be sent to FTP / HTTP CGI, e-Mail, or local storage (for select models only), while video can only be uploaded to FTP, HTTP CGI servers, or local storage (for select models). If Audio in is enabled in device, the uploaded video will include audio.

The parameters needed to setup this function are different for each task combination (snapshot / ftp or video / HTTP… etc), and are explained below:

Enable								UI
								Upload video/snapshot and Audio 1 ☑
Upload Media Type	Snapshot				Video			Upload Media Type ◉ Snapshot ○ Video
Upload Media to	Email	FTP	CGI	Local	FTP	CGI	Local	Upload Media To E-Mail
Upload Period	Y	Y	Y	Y	Y	Y	Y	Upload Period 0 (0~86400 seconds)
Image during Upload Period	Y	Y	Y	Y				Images during Upload Period 0 (Use 0 for maximum number of images)
Pre-Buffer Time					Y	Y	Y	Pre-Buffer Time 0 (0~10 Second)
Image File Name	Y	Y	Y	Y	Y	Y	Y	Image File Name Front_Door_%YYYY_%MM_%DD
Upload Path		Y	Y	Y	Y	Y	Y	Upload Path Camera/%N
CGI Path & Program			Y			Y		CGI Path & Program
E-Mail Recipients	Y							E-Mail Recipients using ; for multiple addressed
Subject	Y							Subject Front Door Snapshot
Video Source	Y	Y	Y	Y	Y	Y	Y	Video Source 1

Upload Video/snapshot and Audio checkbox: this decides if this rule is in effect, or disabled. Sometimes it is useful to keep the settings for troubleshooting purposes, but keep them as disabled.

Upload Media to: these define the task at hand, and change the field that needs to be filled out.

Upload Period: IP device will provide video/snapshots for the number of seconds here. It will stop uploading video/snapshot at the end of this period. If you have video management software recording from this camera at the same time, the normal recording through NVR will not be affected, and goes on throughout the event period and afterwards. But the special upload session will end as the event ends.

Image during Upload Period: This is used only by snapshots. This tells the camera how many snapshots it should attempt to capture during the Upload Time. If this value is set to 0, then the IP device will attempt to capture as many snapshots as possible. Depending upon the device loading, the number of snapshots taken may not reach the number you specified.

Pre-Buffer Time: This is only used by video. If this is set to more than 0, then the IP device will start to buffer video in its internal memory. The maximum pre buffer is **10 seconds**. When an event requires video upload, the IP device will first upload the video taken right before the event then keep uploading until it reaches the upload time.

Image File Name/ Upload Path: You will need to specify rule for file names and upload paths (upload path is not needed for Email. Just put a slash "/" in the field). The rules contain flexible parameters. A sample rule and corresponding filename will look like this:
Front_Door_%YYYY_%MM_%DD@%hh%mm%ss
Front_Door_2009_10_12@195037.JPG

Upload Path folders may also be named dynamically. For the IP device to create folders on FTP and HTTP CGI servers properly, your FTP/CGI account will need to have permission to create folders. For syntax on auto naming, please see online help or the inset box at the end of this section.

The symbol "%" cannot be the first character in filename or upload path. Please use either an alphabet or a number as the starting character. For Upload Path, be sure to start and end eith a backslash"\". An example will be : \Backgate%MM%DD\

CGI path & Program: Some CGI servers may require special info and settings. Please refer to CGI server designer for this section. IP devices do not allow upload of Snapshots / Video into their embedded CGI servers.

E-Mail Recipient / Subject: When uploading video/ snapshots via email, these fields are required.

Video Source: Choosing the video source from video 1 or video 2.

Auto Naming Rules for Files and Folders:

To properly track images and videos, a well thought out naming rule is necessary. There are a number of automatic variables available to design a proper naming system, which may be used both on files and folders.

Symbol	Description	Example
%YYYY	4 digits for year	2009 for year 2009
%YY	the last 2 digits of 4 digits year	09 for year 2009
%MM	two digits for month. 01~12	01 for January
%DD	two digits for date. 01~31	01 for the 1st day of a month
%hh	two digits for hour. 00~23	
%mm	two digits for minute. 00~59	
%ss	two digits for second. 00~59	
%W	a space character. ' '	' '
%N	camera name	camera-1
%Y	File serial counter. It starts from 1 in every uploading task. The counter will be increased by 1 for next uploading file.	1,2,3,4,5,...

Example

1. Entrance-%YYYY-%MM-%DD@%hh%mm%ss for time 2009/06/05 22:50:30.

The full name is Entrance-2009-06-05@225030

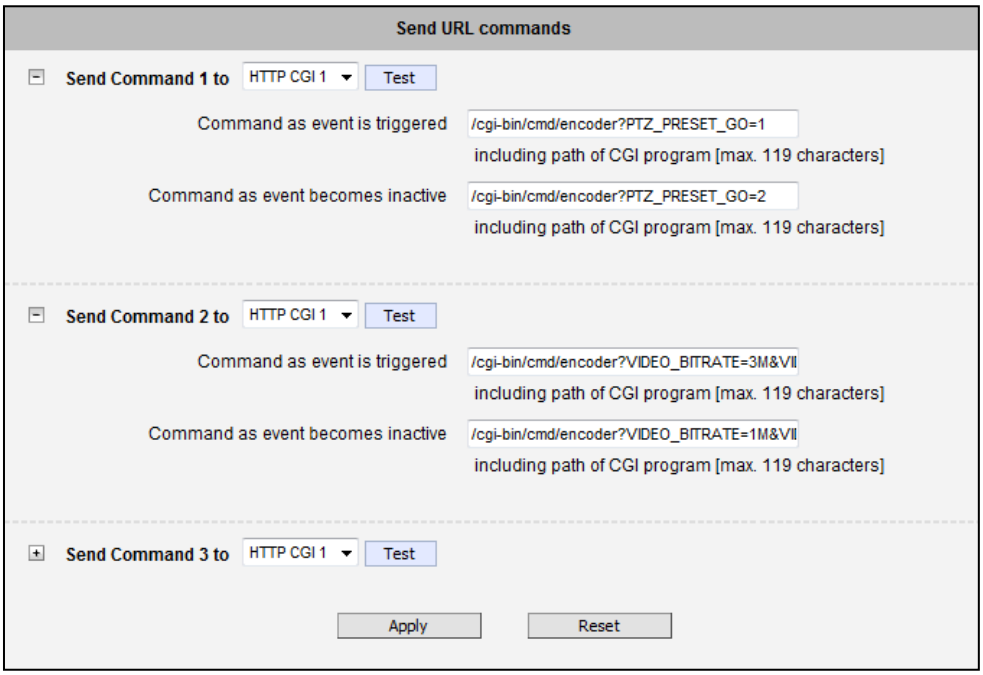
2. X_%w-%N_TEST%Y for camera name is 'my-camera' and three successive uploaded files.

The full names of these three files are

X_ -my-camera_TEST1, X_ -my-camera_TEST2, X_ -my-camera_TEST3

Send URL commands

*Pre-requisites: **HTTP CGI server setup.**



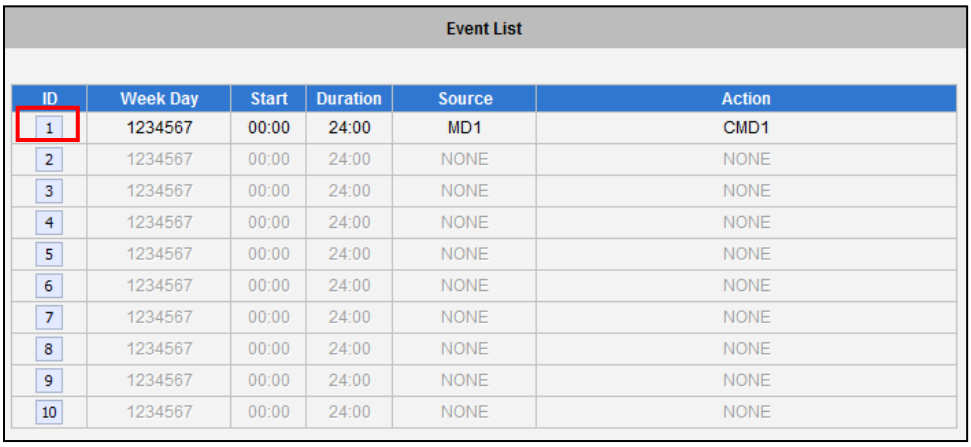
URL commands can be sent to HTTP CGI servers upon event. This provides the possibility of highly intelligent response upon event. IP devices and many other devices also have embedded CGI servers that may be controlled.

When Event Handler sends an URL command, it will send one set of command when the event is trigged, and another as the event becomes inactive. Depending on the CGI design, the URL commands may be able to be stringed together, and multiple commands may be issued in a single line.

An example would be when the access control device at the entrance detects an entry, this device provides a DI signal to the PTZ camera, and triggers an event. This event then sends a loopback command to the PTZ Camera itself (by setting its own IP as the HTTP CGI server). The PTZ Camera then moves to a preset location, stays until the event is over, and then moves back to another location. At the same time it moves to the pre-set location, it increases the bitrate from 1M to 3M, and the frame rate from 4 fps to 8 fps. The bitrate / fps changes are reverted at the end of event.

Event List

You may define a maximum of 10 Event rules, which will be shown in abbreviated form in the Event List panel. It will display under each Event ID, the days of the week it will be active, the start time and duration of the active period, the type of the source of trigger, and the actions used in the response. If the row is grayed out, this means the rule is currently not enabled and stays inactive.



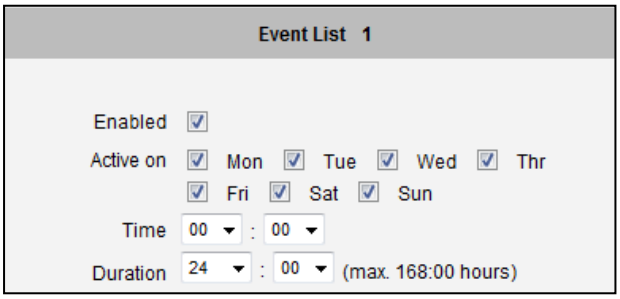
You may start creating a new event by clicking the event ID number in the list, for example “2”. There are several parts to the Event rule:

When is it active?

You may choose to enable the rule or not. The settings will be kept in internal memory even if the event rule is disabled. Select the days in a weekly cycle in which this rule and schedule is active.

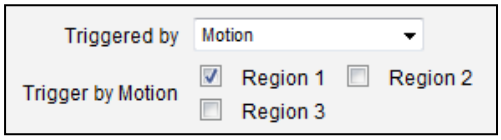
Determine the start time and duration of the active period. For example, a rule that lets motion detection trigger snapshot uploads to FTP would only take place after 19:00 each day for 12 hours. Outside of this time the rule will not be active.

In the example below, the event handler rule is active 24 hours a day, 7 days a week.



How is it triggered?

Events may be triggered by one of the several sources. In the example below, Motion Detection region 1 is used as the event trigger.



You may also ask the event to be repeatedly triggered during this scheduled time. The interval is determined in minutes. You may use this with email / FTP upload to take snapshots at regular intervals.

DIs: For selected models only, the IP device may be triggered by Digital Input.

Motion: You may trigger the event if one or many Motion Detection regions encounter a motion trigger. Trigger from any of them will initiate the event. The duration of event will be the same as the MD trigger length, or the Trigger interval time, defined in the Motion Detection section on Video Adjust page.

Video Loss: This is available for video servers only. When the analog video in is lost, the video state will become “lost”, and return to “normal” only until device receives analog video signal. A common scenario is for Video Server to send email to administrator when video is lost, and activate DO signal to alarm that persists until the analog signal is restored.

Switch to Night mode: This is available to selected models only. When camera changes between day and night modes, the embedded event handler will notice this change, and may act upon this information.

Potential uses include changing the motion detection profile to another set of Event MD parameters. By having two sets of parameters each optimized for day and night, this provide better overall accuracy in both day and night conditions. Some night time only MD regions may also be activated this way. The event period will end when the camera returns to day mode, which will then reset the camera to the original settings.

Device boots successfully: This will trigger the event responses once the device boots up. You can use this to create a notification system that keeps record of when the device has been rebooted via email.

Reboot device: This triggers the event response when the device is shut down via web UI “Save and Reboot”. Use this to keep record of when was the device setting edited. Note that this will not take effect when the device is unplugged, as this is not normal shutdown.

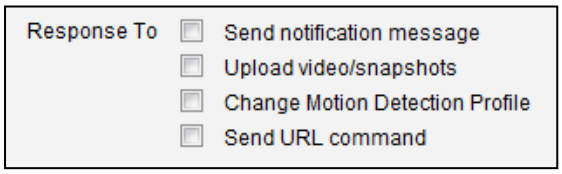
Run out storage space (with storage card only): Trigger occurs when the memory card space is full.

Fail to write storage (with storage card only): Trigger occurs when there is an error in writing data to the memory card.

Remove storage media (with storage card only): Trigger occurs when the memory card is suddenly removed from the device.

What responses will occur?

Available responses vary depending on what triggered the event.



Digital Output (selected models only): This is a useful link to other devices. Click to include this in the response for this rule.

Send notification Message: Select from the three pre-defined messages which you’ve setup in the Event Configuration section. You may enable multiple messages at the same time. For sending Email, please limit the recipient to one per event rule. If you need to send email to more than one recipient, please use separate event rules triggered by the same trigger.

Upload video/snapshots: Select which of the event configurations to include in this response set. If you are sending email via upload video and sending notification message at the same time, the system will automatically merge the two emails into one. The subject and image will be based upon the Upload snapshot Event configuration enabled, but the message in the body text will be based upon the Notification messages.

In general, please stick to the “one email per event rule” limit for best performance.

Change Motion Detection profile: This will switch the profile of the selected Motion Detection region from Runtime profile to Event profile. The profile will return to runtime settings at the end of this event. You may program one motion detection region to be disabled at runtime, but enable it with event handler under some circumstances.

Send URL command: Select the URL command to include in the response set. Two different commands will be sent at the time when the event is triggered and un-triggered.

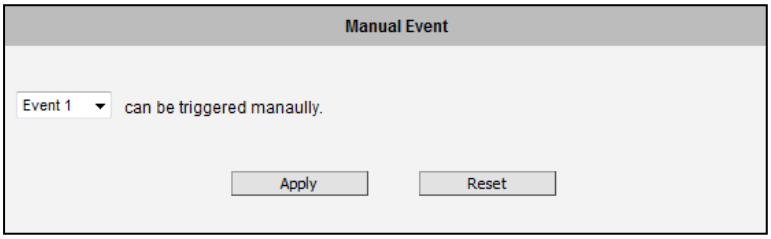
Change to Night Mode (Selected models only): For some models, you may force the Camera into Night mode. The camera will return to its previous setting (whether auto or forced day/ night) upon the end of the event.

Go to a preset point: if the device is a PTZ camera, and there are preset points already configured in PTZ setup page, then you may include this in the response section of the event rule by using Send URL Command method. It is possible to let the camera return to another preset point at the end of the event.

After changing any of the items above, press **Apply** to save the changes. The **Reset** button undoes the changes that had just been made but not Applied yet.

Manual Event

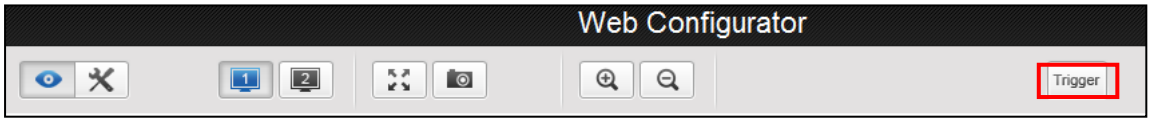
You may select one event in the Manual Event area below the event list to be triggered via web user interface.



After changing any of the items above, press **Apply** to save the changes. The **Reset** button undoes the changes that had just been made but not Applied yet.

Once selected, the trigger button on the video display screen will show as clickable. Click to trigger the selected event. This is useful during event rule testing.

The live view panel would look like this:



Local Storage Management

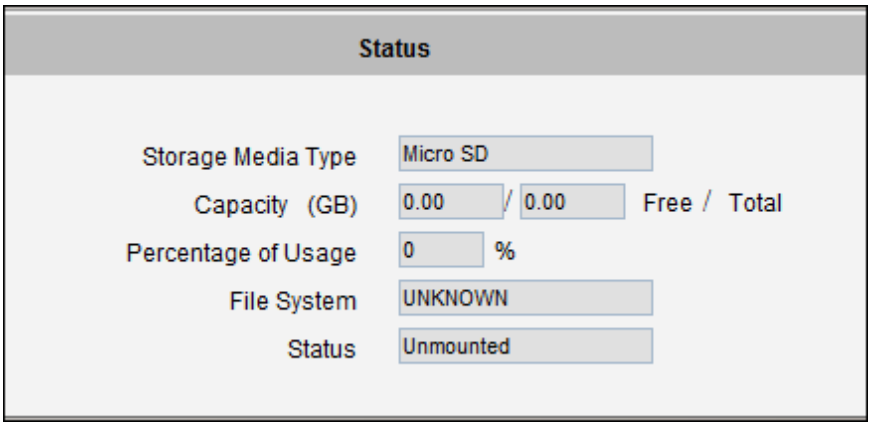
The cameras that come with built-in local storage capability will have the **Local Storage** menu shown on the **Setup Page** when a memory card is inserted into the memory card slot of the device. Video recording is automatically done when a memory card is inserted. Make sure to "format" the memory card first when using the card for the first time or if the card has been used in other devices.

The **Local Storage** menu allows users to manage the storage itself and the files that are stored in the memory card.

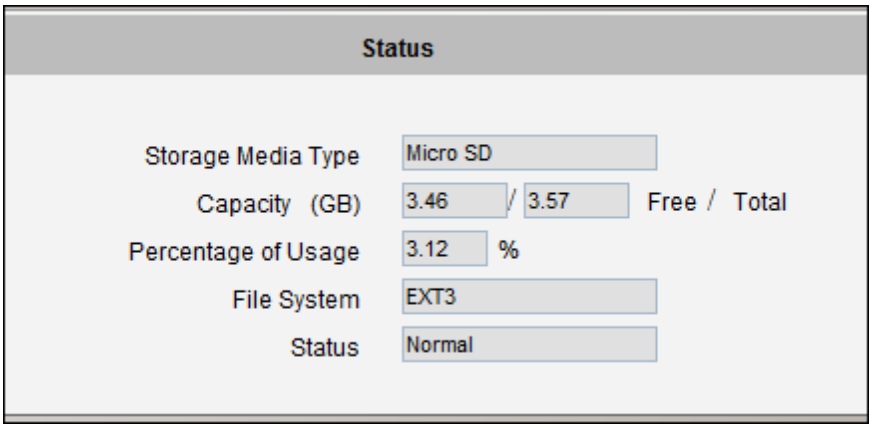
Click the ⊞ **Local Storage** menu on the **Setup Page**. Three (3) submenu items are available – **Status**, **Utilities**, and **File Management**. If the memory card has not been formatted or mounted, the **File Management** submenu is grayed out and cannot be accessed.

Status

When the mass storage has not been formatted or mounted yet, the camera would not know the status of the storage, and the output would be as follows:



If the mass storage has been formatted or mounted already, the Status page will show the details of the storage:



In case of IP cameras with installed memory cards, the Storage Media Type will show “Micro SD”.

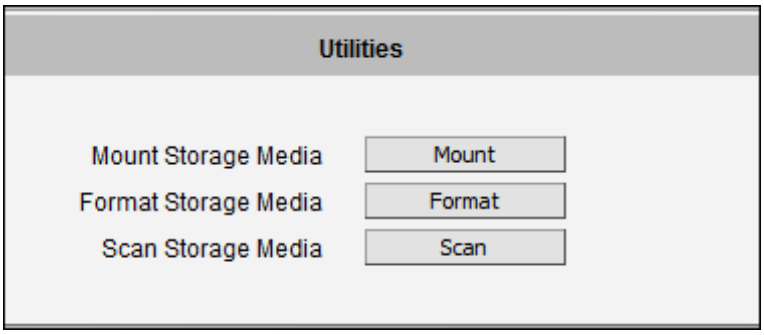
NOTE: Supports microSDHC and microSDXC cards only.

The capacity of the disk is shown in Gigabytes.

The file system is Linux based EXT3, which is different from Windows based PC file systems. If you remove the storage from the camera and plug it directly to Windows based PC, it may not be able to read its content. The chapter File Management explains the correct ways of accessing files of the local storage.

Utilities

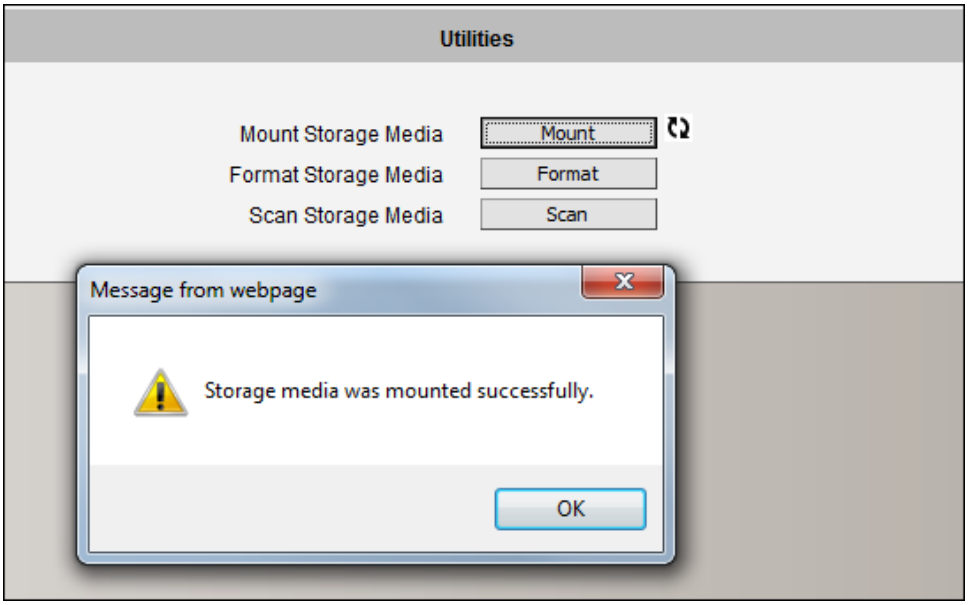
The “Utilities” are responsible for managing the storage itself rather than the files on the storage. There are three utilities – Mount, Format and Scan.



Mount

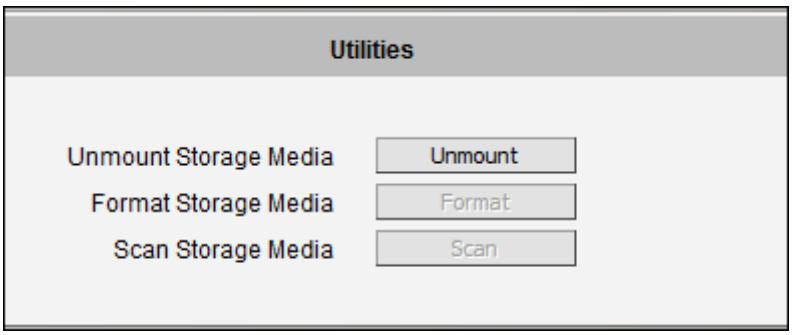
When the Mount storage media button shows “Mount” button then it means that the mass storage has been inserted to the camera, but the connection between camera and the storage has not been established yet. By pressing the “Mount” button, the storage becomes active. It is then possible to check the Status of the disk, write or read data on the disk, remotely access the storage by Web Configurator or FTP client, etc.

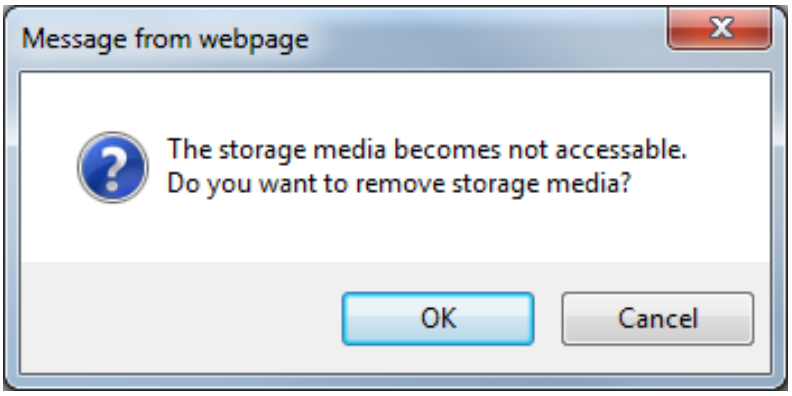
When pressing the “Mount” button, the mounting process will start.

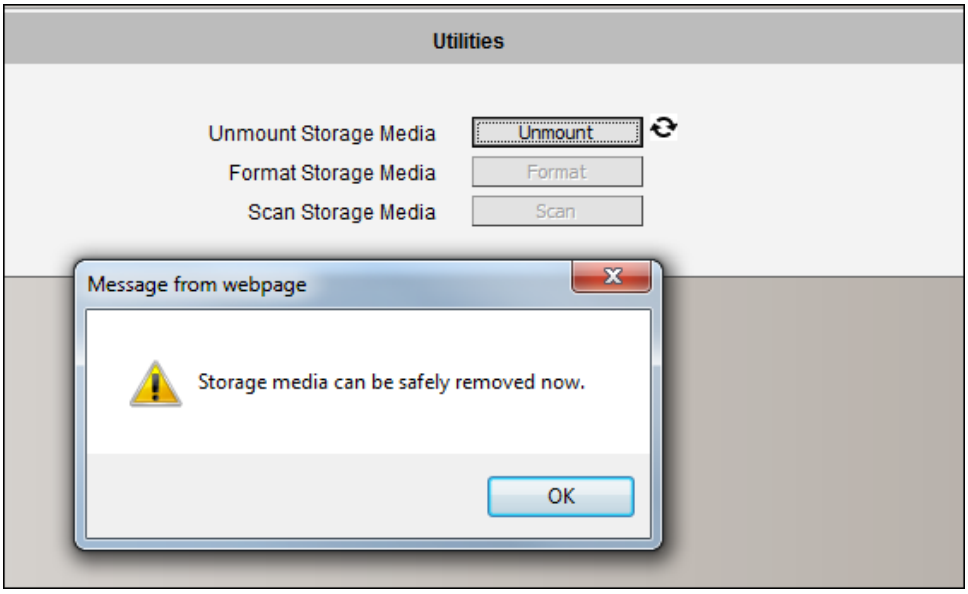


Unmount

Once the drive has been mounted, it can later be unmounted by pressing “Unmount” button, if necessary.







That Unmount function is used when the camera is to be shut down for maintenance or when the mass storage has to be physically removed for some reason. The purpose of unmounting is to protect the currently processed data on mass storage at the moment of removal of the storage. If

the local storage is being used by camera and some videos or snapshots are being recorded to the disk, then the sudden shutdown or removal of the disk without unmounting may corrupt the file that is currently being used by the camera. The rest of the files are not influenced in any way. Please note that “Save&Reboot” function of the camera also does unmounting automatically for the user.

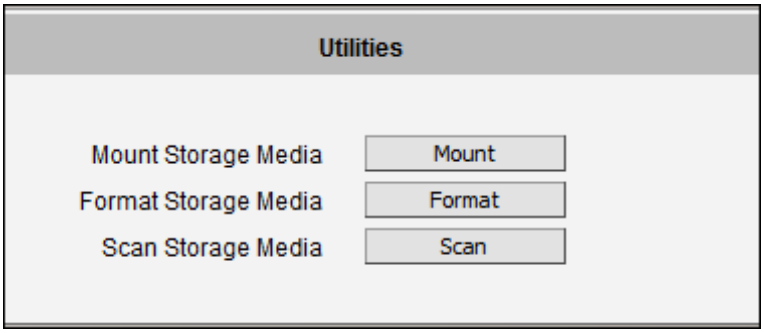
Mount Failure

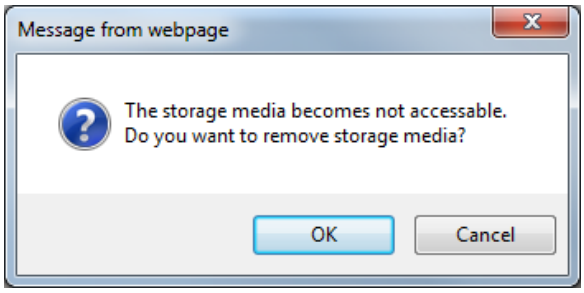
If the inserted disk’s file system is not EXT3, then the Mounting would fail and an error message would appear.

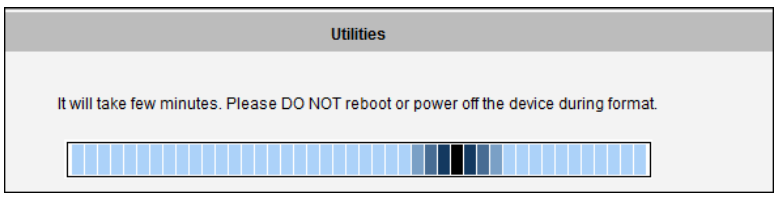
The common reason is that the disk may have previously been used in other file systems, such as Windows based PC or photo camera. If the disk does not have the right file system, then you will get an error message. In that case the disk has to be formatted first. The camera provides convenient formatting function within Web Configurator.

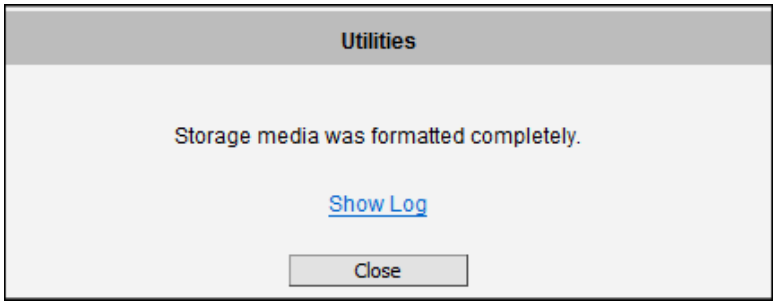
Format

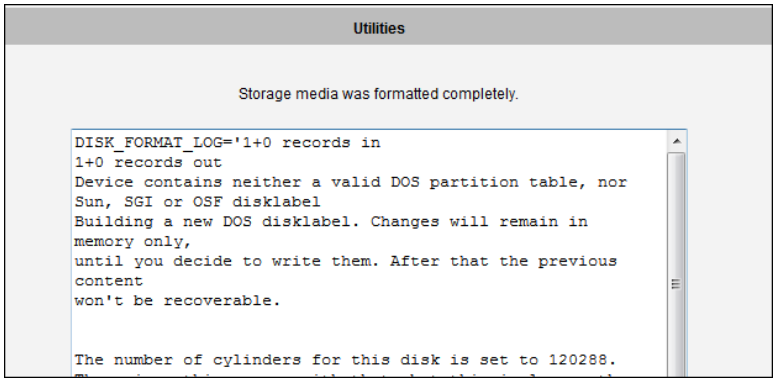
When the disk is inserted to the camera for the first time, it is recommended to format it, to make sure the file system of the disk would be compatible with camera. If the disk has already been mounted, the “Format” button is grayed out, unmount the disk first to enable the “Format” button.









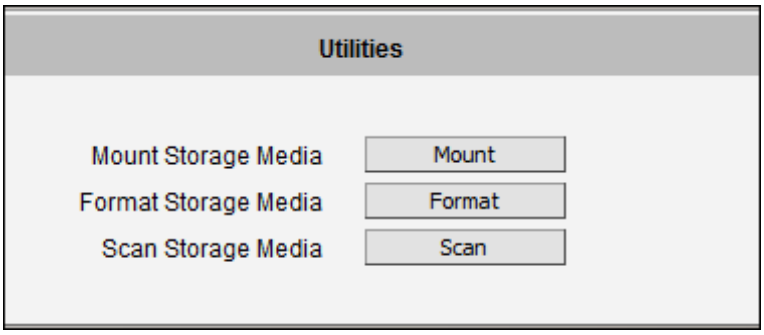


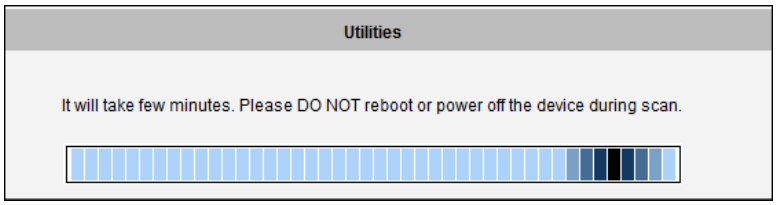
Format Failure

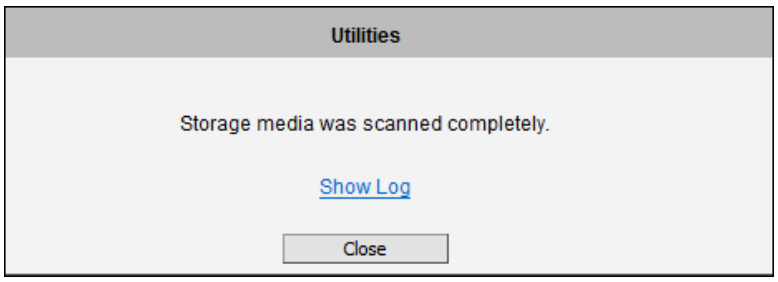
If the disk is damaged or it is not within the specifications of the camera, the formatting may fail. When this happens, there is no way to continue using that disk, and it has to be replaced with a proper one.

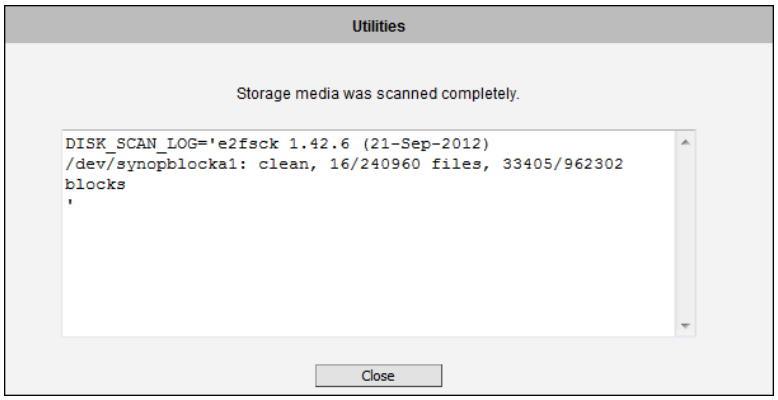
Scan

To check the “health” of the disk, it is possible to use the “Scan” function. If the disk has already been mounted, the “Scan” button is grayed out, unmount the disk first to enable the “Scan” button.









Scan Failure

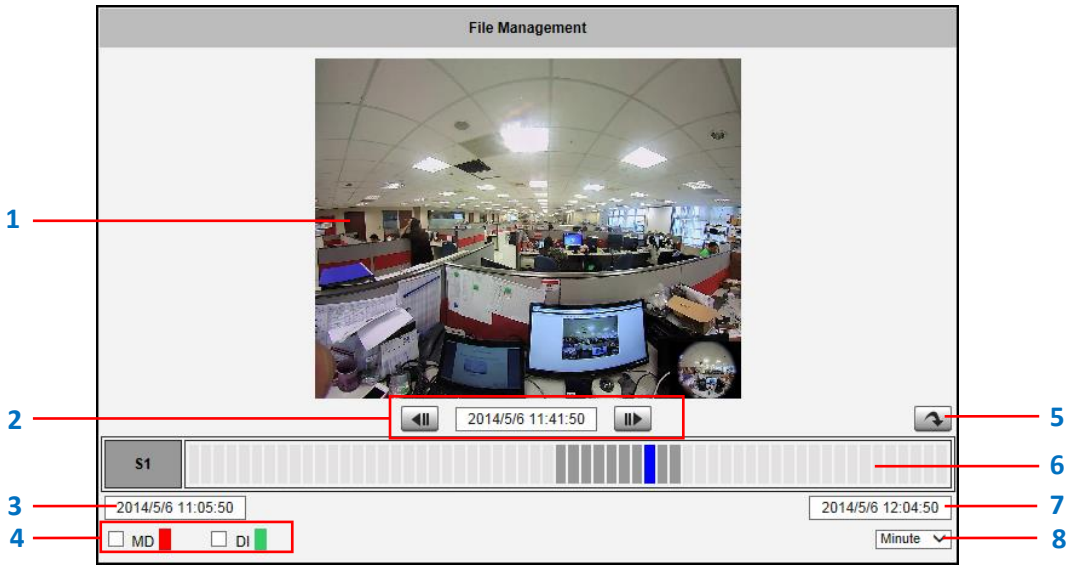
The scanning would fail if the disk is not recognized by the camera. Make sure that the disk has been properly formatted and mounted to the camera.

File Management

The **File Management** submenu is available only when the memory card is mounted to the camera. When a memory card is inserted into the camera, stream 1 is automatically recorded to the memory card.

NOTE: Make sure to “format” the memory card first when using the card for the first time or if the card has been used in other devices.

Click a video timeslot from the timeline bar to select and view its snapshot. A selected video timeslot is indicated by a blue bar.



NOTE: The **Snapshot** window is available only when using Internet Explorer browsers.

Item		Description
1	Snapshot Window	Displays the snapshot of the selected video timeslot.
2	Time of Selected Video	Shows the time of the selected video timeslot. Click the arrow buttons to scroll the timeline bar to the previous or next page.
3	Start Time of Timeline Bar	The starting time (left side) of the timeline bar.
4	View Event	Check the box to view events recorded: • **MD** (Motion Detection): When MD box is checked, the timeline bar will show red bars if motion is detected on a timeslot. • **DI** (Digital Input): When DI box is checked, the timeline bar will show green bars if the digital input is triggered on a timeslot.

5	Go to Current Time	Click the button to go the current time.
6	Timeline Bar	Allows users to browse and select the recorded videos by timeslot. The bars on the timeline bar indicate each video timeslot. • **Dark gray** bar indicates a recording is present. • **Light gray** bar indicates no recording. • **Red** bar indicates motion is detected on that timeslot. • **Green** bar indicates the digital input is triggered on that timeslot.
7	End Time of Time Bar	The ending time (right side) of the timeline bar.
8	Time Unit	Select the unit of time to use to display the timeline bar.

How to Export Video?

1. Select the starting point of the video to export from timeline bar. The bar turns blue.
2. Click the right mouse button and select **Mark Export Start**.
3. Click the ending point of the video to export. The bar turns blue.
4. Click the right mouse button and select **Mark Export End**. The scope of the starting to the ending timeslot is marked blue.
5. Click the right mouse button and select **Export Video**.
6. Save the video file (**.raw**).

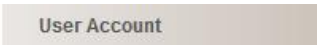
The exported video can be played back using **Archive Player**, a free video player tool, downloadable from the website.

NOTE: The camera memory is allocated to deliver continuous live streaming to all connected users or devices, such as for NVR recording purposes. The camera will store as many P-frames as possible on the memory card. However, due to camera memory limitation, the camera may record only the I-frames on the memory card. To increase the number of P-frames to record on the memory card, it is recommended to lower the FPS, bit rate and resolution of Stream 1 (see ***Compression*** on pge 58).

System

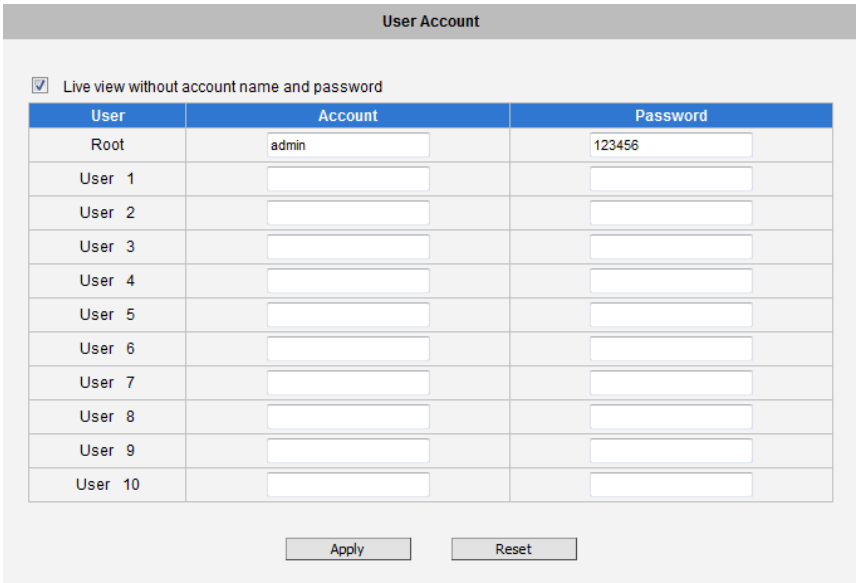
The section **System** provides the list of functions that help manage the camera. The [+] mark before System indicates that the list can be expanded by clicking on it. Once expanded, the list can later be collapsed again by clicking on the [-] mark.

User Account



The section User Accounts allows doing following user management tasks:

1. Change the account name or password of the Root account that has a full access to the camera.
2. Create up to 10 common users that only have an access for live view and PTZ control.
3. Enable/disable the option of seeing the live view without needing user name and password (anonymous login), which is especially convenient function for camera installers on the field. For security reasons, account name and password is always required when entering Setup page of Web Configurator or when trying to access camera or change settings by URL commands.

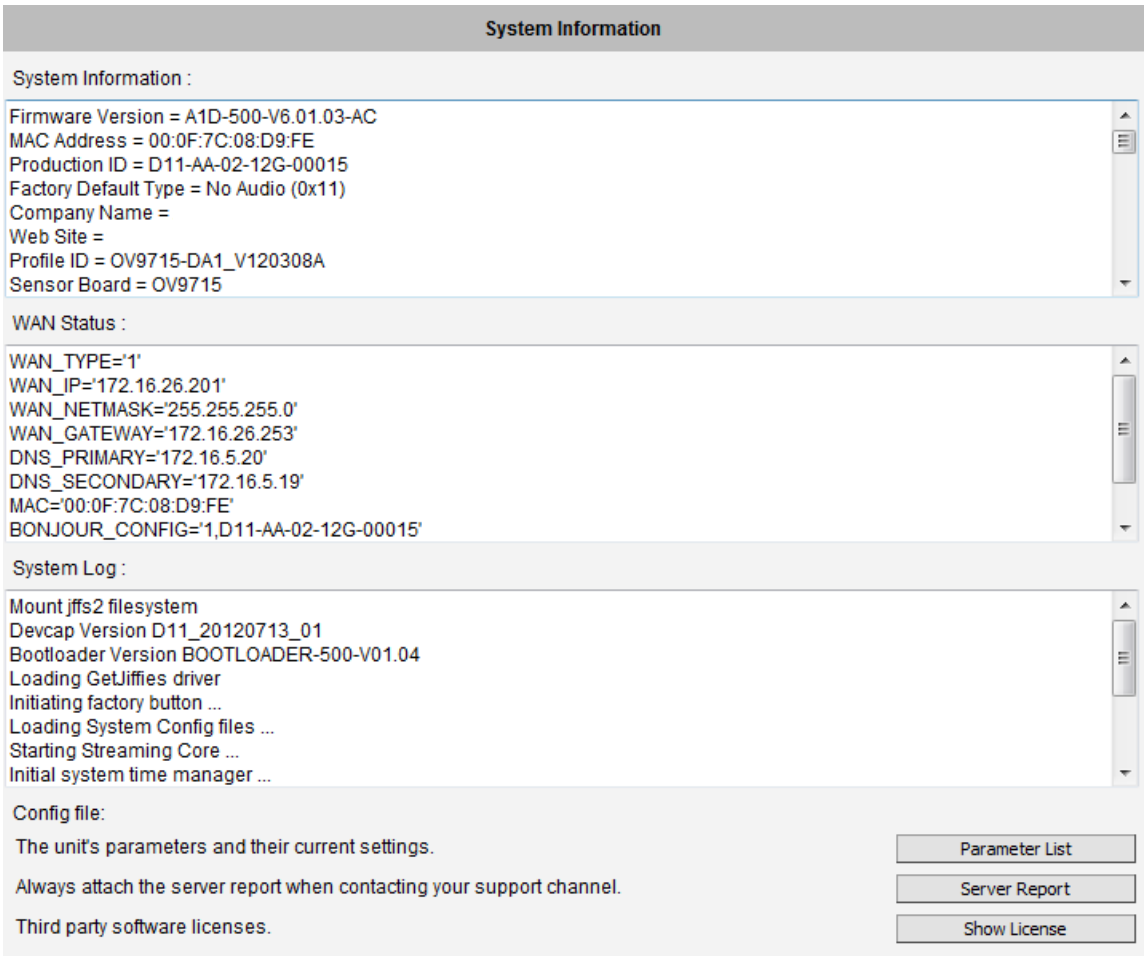


After changing any of the items above, press **Apply** to save the changes. The Reset button undoes the changes that had just been made but not Applied yet.

System Info

System Info

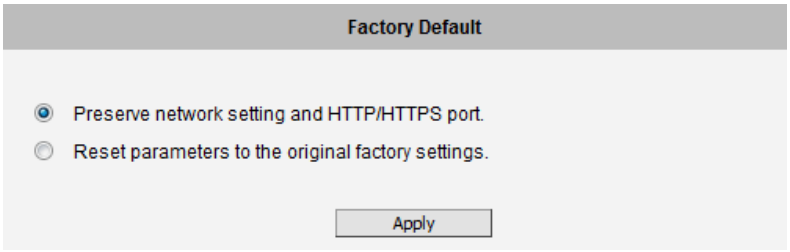
The section **System Info** provides the full information about camera status, settings and log. This information is very helpful while doing the camera configuration, maintenance or troubleshooting.



The **Server Report** is a convenient way of exporting the full list of camera related information in a text format, so that it can be sent to the technical support team for faster service.

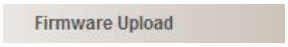
Factory Default

Factory Default The section **Factory Default** allows the camera settings be reset to the original factory settings.



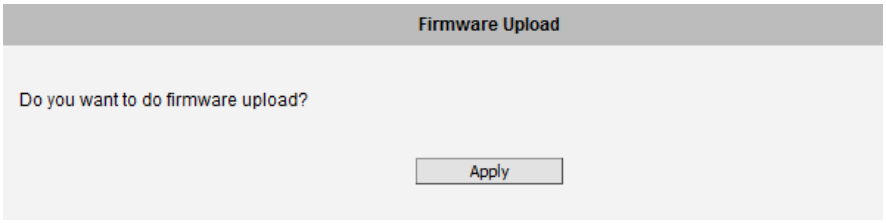
If you want to keep network settings and restore other settings to factory default, please select the first option. If you select the second one instead, all the settings would be removed during factory default. You will have to use factory default IP setting to connect to this camera.

Firmware Upload

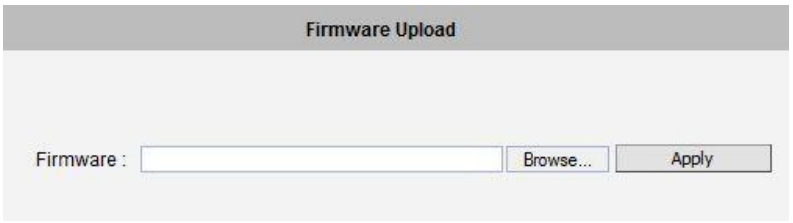


The section **Firmware Upload** allows remote upgrade or downgrade of camera firmware. The upgrade to newer version is usually done in order to gain new functions or fix existing bugs or limitations while downgrade to older version is used mostly for integration purposes where the newly purchased camera model comes with the newer firmware version than supported by a third party video management system of a given project.

The firmware image file can be downloaded from the website. It has the file extension ".upg".

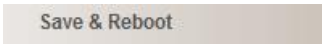


After pressing **Apply** button, it is possible to browse for firmware image file that has already been downloaded to the computer that has the Web Configurator running.

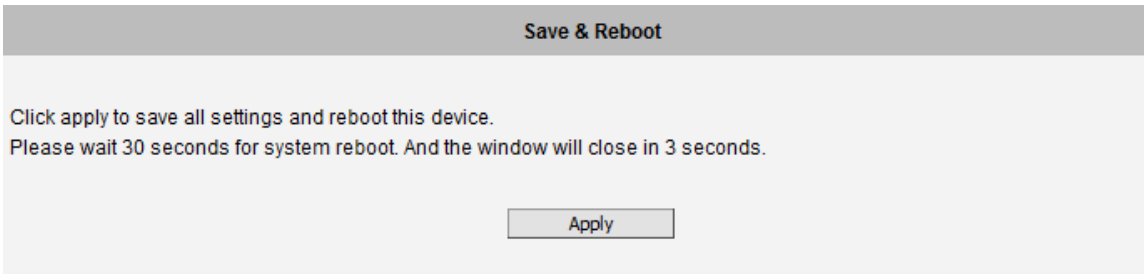


Click **Browse** to select the upload image file. Click the **Apply** button to start the upload.
Once the process is finished, you will get an "OK" message and system will reboot itself.

Save & Reboot



The **Save & Reboot** section allows saving the settings and rebooting the camera remotely. This is critical because some settings might not take effect before save & reboot.



Logout

Clicking this item allows you to log out of the IP device. Be sure to logout this IP device once you have completed all the tasks via Web Configurator.

Troubleshooting

Although the default settings of the camera are ideal for 90% of the cases, there may be some rare cases when the settings need to be adjusted or the device has to be examined. The following section provides easy troubleshooting solutions for most cases. In some occasions, the unexpected symptoms may be the result of selecting the product that is not suitable for given environment.

For more detailed explanations and instructions of each situation, please refer to the complete **Troubleshooting Guide** on the website.

Image Quality Troubleshooting	
Problem	Solution
Motion blur	Increase shutter speed
Blurry image	Auto Focus: Refocus button; Manual focus: adjust manually
Too narrow DoF	Reduce aperture size, widen the viewing angle, install camera farther from objects
Too narrow viewing angle	Vari-focal lens: widen the viewing angle; Zoom lens: press the zoom-out button; Fixed lens: replace it with wide angle fixed lens or choose another model with wide angle lens
Objects too small	Increase video resolution; zoom-in (zoom lens) or adjust lens to telephoto position (vari-focal); Install the camera closer to target; Change to the lens with longer focal length; Change the camera model with higher resolution or longer focal length
Underexposed image	Use Auto Exposure Mode and increase AE Reference Target; set the Slowest Auto Shutter Speed to slowest possible (1/5s); Add external light source to illuminate the area the camera is shooting
Overexposed image	Use Auto Exposure Mode and reduce AE Reference Target if necessary
Noise	Enable DNR; Enlarge the aperture; Lower AE Reference Target in Auto Exposure mode; Lower the Exposure Gain in Manual Exposure mode; Lower video resolution; Add extra visible or IR lights
Blocking & mosaic	Increase the bitrate
Wrong colors or color rolling	Manually correct the colors by using white paper “Hold” button in Auto White Balance mode; Adjust the camera’s position or viewing direction; Adjust the light source
Black image	Make sure there is sufficient light; Make sure the Day/Night Mode and IR LED Control are both in Auto mode; Make sure that the “Switch from Day mode to Night mode” does NOT have the most extreme value – 100; Manual iris: open the iris by rotating the ring towards “O”; Remove the protective cap of the lens during installation

IR light reflection	Make sure the dome or bullet cover is tightly mounted; Reduce the AE reference target in Auto Exposure mode; Reduce the Exposure Gain in Manual Exposure mode

Streaming Quality Troubleshooting	
Frame Rate Too Low at Night	In auto exposure mode, set the Slowest Auto Shutter Speed to be not slower than the interval of frames; In manual exposure mode, set the Shutter Speed to be not slower than the interval of frames
Latency	Use dual stream (stream 1 for recording, stream 2 for live view); Lower the bitrate; Lower the resolution (if acceptable for user); Check the cable quality; Make sure to use industrial grade switches and routers; Check the NVR server & client PC requirements from NVR manual
Jitter	Use the NVR that has the video smoothening algorithm for live view and playback
Dropped Frames	Use the Playback function of NVR – use frame-by-frame validation of jitter-looking sections, to see if any frames are dropped; To troubleshoot the data switch/router and VMS computer, you may also ask for assistance from technical support team of camera manufacturer